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NEW SERIES "MECHANICAL AND MILLING NEWS"

OLD SERIES, VOL. XI. } NUMBER 1.
NEW SERIES, VOL. IV. }

TORONTO, ONT., JANUARY, 1894

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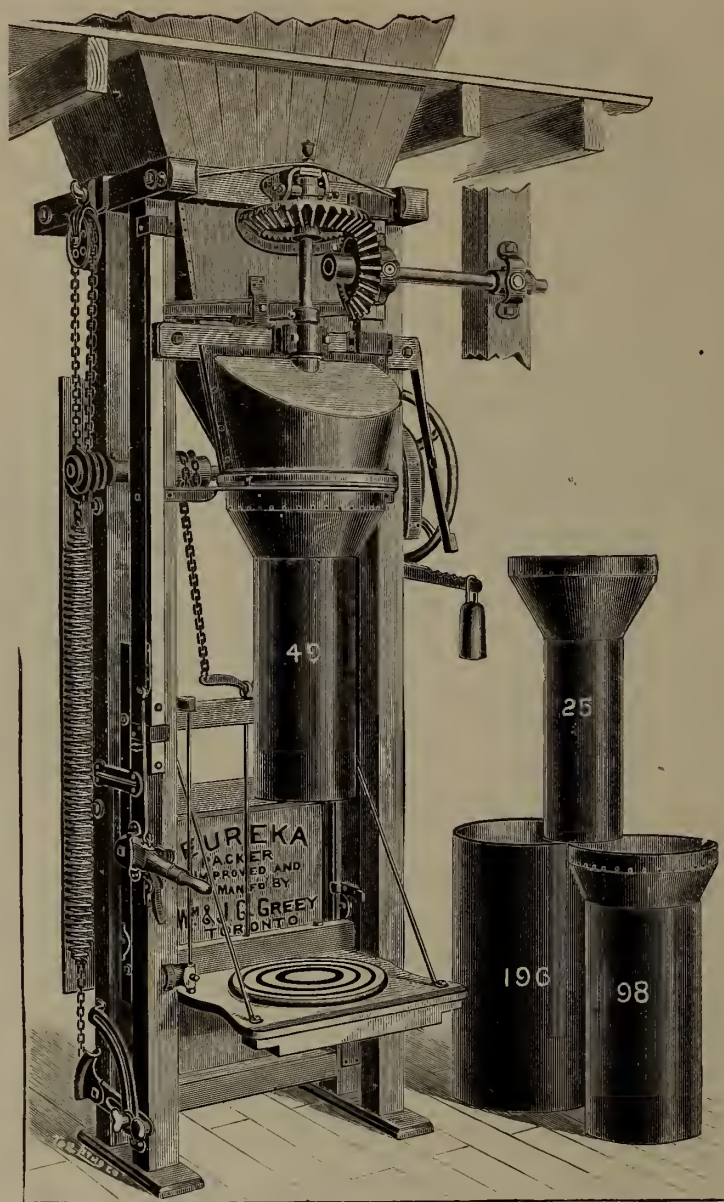
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THE CANADIAN MILLER

OLD SERIES, VOL. XI. } NUMBER 1.
NEW SERIES, VOL. IV. }

TORONTO, ONT., JANUARY, 1894

TERMS, \$1.00 PER YEAR
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WHEAT CLEANING.

IN the December issue of the CANADIAN MILLER we published an article on wheat cleaning from the Roller Mill. The subject has much of practical interest in it to all millers, and this is reason enough for reproducing here an article from the same source, on the same subject, but from another writer. The starting point of the article is found in the question: "Does the cleaning of wheat receive as much care and attention from the miller as the operations of reducing, separating, and purifying? Hardly. And yet, anything that the cleaners ought to take out and don't is sure to show up in the flour.

We have a good line of cleaning machines, such as, for instance, a receiving and milling separator, a cockle machine, smutters, scourers, and a magnetic separator. The separators may do their work well. The cockle machine that does not remove small wheat along with the cockle has not appeared. Now for scouring and polishing.

The smutters have finished their part with too much work done on the sides and not enough on the ends, especially the small end. If wheat but grew round like a pea, our present methods and machines would suffice for polishing it up to the queen's taste. We are in the wilderness, grinding unclean wheat. Who shall lead us out? Who will produce a machine that will polish the ends of wheat as well as the sides and still not break the grain?

It must be said, however, that much of the present bad work is due to bad use of machines.

We run machines above their true capacity, which conscientious manufacturers disapprove of.

The practice of running both spring and winter wheat through the same line of machines is a wrong one; the perforations in the sieves do not suit both kinds of grain.

Changing the wheat every two hours, or twelve times a day, necessitates a slight change of the valves in order to get the proper suction for the different varieties of wheat; but this is rarely done.

The machines are often allowed to run empty, which results in more or less broken wheat.

Not enough millers realize that it is very important to keep the feed on cleaning machines as regular as possible.

Had we a small line of screenings cleaning machinery to take out the best of them for grinding into low-grade, we should have cleaner wheat and be better able to detect any loss of good grains. Moreover, this practice would improve all the flours—patent, baker's, and low-grade—and, last but not least, as the merest novice can see, the yield."

NO MORE BELTING.

A NEW Belgian factory, according to a correspondent in that country, uses electricity to transmit its power instead of belting, and a brief description of his advice may prove of interest. The dynamo is 500-horse-power, and forms the fly-wheel of the compound Corliss engine. The shop is supplied with 16 motors, and among them are ten 16-horse-power, one 21-horse power and one 37-horse-power motors. Their average efficiency is 87.2 per cent. On some of these motors the load is very variable, and several are exposed to dust and dirt, so that with 90 per cent. efficiency of the dynamos, 98 per cent. of the conductors 87 per cent. of the motors, the net result is 76.6 per cent. power delivered. As the lost work in belt-driving is practically a constant quantity for all loads, or at least is usually considered to be, the power required to turn the shafting and pulleys, when no work is being done on the machines, it follows that taking 79.4 per cent. as the final output in two cases, one of electrical

and the other of mechanical transmission, we find that at a load of 20 per cent. the electrical system would still give 47.2 per cent. useful effect, and the mechanical nothing at all. From careful experiments which have been made in actual practice it has been clearly proved that to drive all the idle machines requires more power than to drive the shops in ordinary course of work; whereas, 11 electrical horse-power is required when driving all the idle tools, only about seven electrical horse-power is needed in ordinary work, of which four electrical horse-power is used to drive the shaft and belts, alone; this shows how small a part of the power produced by the engine is actually used in useful work by the tools. Such satisfactory results of the application of electricity to factory driving must attract attention and will lead to great changes in transmission. Whether in the case of large machine-tools it would not be better to discard shafting and belts altogether, and supply a special motor to each tool, is a question which must be settled for each individual case which may arise; the current would be switched on or off just as easily as the belt is now thrown from the loose to the fast pulley, and vice versa.

AN ECHO FROM THE BAKEHOUSE.

"I SAY, guv'nor, I can't do nothing with that last load of—'s flour; see how it squats in the oven." Such is what we have heard. The miller must be, methinks a most enduring creature, since that it is always he who, has to put up with the inability of the nineteenth century journeymen to cope with the varying conditions or varying materials, writes a correspondent of the British Baker. The cause of a loaf "squatting" (that is rising and then falling in the oven) must obviously be that the tissue of the loaf or flour lacks strength enough to retain the gases or steam. But when Black Bess fell dead, did Dick Turpin chide his splendid animal for its weakness, or did he realize the excess of work he had given it? If this error of overwork or over-fermentation be pointed out, one is immediately told that the process is the same as usual, and has given good results with So-and-so's flour.

Many of us do not sufficiently understand the differences in grades of flour. This was the reason, and is still the reason in some country places, that roller flour was so opposed when first introduced—it was not understood. The fine dressing—i.e., passing the flour through fine silks—of the rollers millers, in conjunction with other alterations, not only altered the very character of the flour, but also obviously removed the coarser particles of flour, to which the baker had become accustomed—which coarser particles contained much of the life and strength of the flour at the expense of its purity and color. When the yeast of fermentation is such as to require extra life and strength in the flour, although greatly improved, happens to slightly vary in its character, and be worked without a change of process, then arrives the collapse. In the case which has now come under notice a proportion of liquid brewers' yeast is used. This cannot be calculated to at any rate lighten the irregularities of using on one day a stone-milled country flour, largely blended by the miller with some low-grade American, and using on the next day a delicately dressed, roller-milled flour, unadmixed with the coarse American article, and not having the advantage of the age of the latter.

PRESERVING BOILERS FROM GENERAL CORROSION.

SOME additional evidence is reported in the foreign journals of the success of the method announced a while ago for preserving steam boilers against pitting and corrosion. This is accomplished by fixing electrodes in the boilers and sending periodically currents of electricity through them, under definite conditions, adjusted

and controlled by automatic action. When the current is passing from the anodes suspended in the boiler, to the shell, hydrogen is liberated on the shell and tubes, and oxygen on the anodes; then, by means of the depolarizing apparatus the action is changed, most of this hydrogen and oxygen recombining, with the result that, during the first period, the hydrogen performs two distinct functions—first, it disintegrates mechanically, by its volume, the scale formed on the shell and tubes, and, second, some of the hydrogen combining chemically with the oxygen of the oxide of iron on the shell and tubes reduces this oxide to metallic iron, thus doing away with the oxidation of the boiler without wearing away the metal. The secondary action, in a word, is to facilitate the disintegration of the scale, hasten the mechanical action of the hydrogen in bursting it off, and prevent polarization of the shell and tubes—oxidation, it is well known, not being able to take place in the presence of hydrogen gas.

SAFEGUARDS FOR WORKING ELECTRICIANS.

THE announcements that a means has been invented of rendering any wire charged with electricity instantly dead opens up the question recently discussed in an English electrical journal of the better protection against accidents from heavy currents of workmen in electric light and power stations. It is suggested, among other improvements, that the insulation resistance of the rubber gloves and boots worn by men engaged in high pressure works should be periodically tested. Rubber gloves and boots are subject to wear and tear, and however good the insulation may be when new, it rapidly deteriorates. It is stated that gutta-percha molded boots, with no irons in them, are more reliable than rubber boots, as they retain their insulating properties much longer. It is suggested that all high pressure bars, switches and fuses shall be boxed in, so that the opening of the box would cut off the current and render it impossible for it to be turned on while the box was open. Again, manufacturers are compelled to securely fence in all belts, wheels and other machinery, and high pressure terminals, bars or switches should be placed under similar restrictions. What is wanted is a simple signal to indicate to the most ignorant workman when a bar, or terminal or switch is charged and so warn him off. Such a device would excellently well supplement the use of the newly-invented electric "cut-off" in increasing the safety of workmen in electric light stations.

THE MILLS OF OLD TIMES.

ANTIQUARIAN NUTTALL says: "The first form of mills was probably very little different from the pestle and mortar." This is certainly the case now in Matabeleland. "Afterwards," continued Nuttall, "they were enlarged by the addition of a cross handle to the pestle, by which it was turned. They were worked by bondsmen, but in process of time shafts were added, and they were driven by cattle. The Romans built mills on the aqueducts, and boats containing mills were moored in the Tiber and worked by the tide. Wind-mills were in use on the continent in the 12th century." Mills are frequently mentioned in England, in the Domesday Book, and among the many rights of feudal lords was that of ban-mills, that is, of mills at which the vassals were obliged to grind their corn, and for which they paid in toll or kind. This was not wholly due to oppression, the building of mills being then considered a great undertaking.

GEORGE W. DAWSON'S grist mill, at Plevna, Ont., was burned down a few days ago. Fortunately there was not much grain in the mill, but there is nothing left of the building and machinery.



PUBLISHED ON THE FIFTEENTH OF EACH MONTH

—BY—

ARTHUR G. MORTIMER

OFFICE:

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J. S. ROBERTSON, - - - EDITOR.

THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

A WORD WITH SUBSCRIBERS.

THE January CANADIAN MILLER goes to a large number of subscribers with bill enclosed for subscriptions that fall due at the new year. The amount in most cases is not more than one dollar, and, even where arrears are owing, the indebtedness to the individual is only trifling. But 2,000 such accounts mean anything from \$2,000 to \$3,000 to the publisher, and money is much needed by him at the present time. It costs a heavy outlay each month to produce a journal of the completeness and character of the MILLER. Subscribers, we have reason to believe, appreciate these efforts to give them a first-class trade journal. Our desire is to make further improvements during 1894. Saying this much, we rely upon subscribers responding favorably to the present request to remit promptly the amounts now due.

HOW RECIPROCITY IN FLOUR WILL WORK.

THE opinion prevails with a considerable and influential section of Canadian millers that reciprocity in flour with the United States would work serious injury to the trade here. Some of the reasons advanced by those who hold to this view were given in the last issue of the CANADIAN MILLER. It has been pointed out, also, as another instance, of the altered conditions of milling in Canada, contrasted with the days of a reciprocity treaty, that certain grades of wheat of desirable milling qualities, in which Ontario had practically a monopoly then, and that gave the flour of our millers an advantage over United States flour, have to-day their counterpart across the border, and renders less necessary there these better qualities of Canadian flour.

Whilst Canadian millers, however, are viewing with a measure of fear the possible passage of legislation making flour free between these two countries, we find milling journals of the United States calling upon the trade in that country to secure the preservation of the reciprocity clause in the McKinley tariff, "for it has been a good clause for the millers of the United States." The Milling World, of Buffalo, says: "With reciprocity wiped out, our millers can count on selling from 1,500,000 to 2,000,000 barrels of flour less each year in the markets to the South of us. With the door opened for cheap Canadian flour on the North, and the door closed to our exports on the South, our markets for both grain and flour will, under the Wilson tariff, undergo such a glutting as was never even dreamed before." Nor would the competition, in which it is claimed our millers would get the best of the bargain, be confined to flour, for the same journal tells us that a reduced tariff would prove a serious thing for millers and grain growers alike, "for it means the influx of both wheat and flour from Canada. Whatever available surplus of grain Canada may have, the Canadians will find it more profitable to load off on to our markets than to ship it to England. That will burden our market and break values."

It is another instance of the widely differing views that may be taken by different individuals on the same question.

CHATTLE MORTGAGES ON WHEAT.

THE chattle mortgage is, perhaps, without any exception, the meanest form of lien that can be placed upon

any property. Where in one case it may, after a tough struggle, prove a source of relief from financial embarrassments, in the other nine cases it leads to financial wreckage. It is when employed as a source of financing to commercial wares, that the investment becomes the most troublesome. The history of numerous failures in all lines of business furnishes ample proof in this direction. Invariably there is a tangled thread somewhere in connection with the execution of the mortgage, and the mortgagee is usually the only creditor who finds any satisfaction in the possession of this document of protection, and not unfrequently he gets left.

Retiring-President Atkinson, of the Winnipeg Grain Exchange, in his address before that body a fortnight ago, touched in terse terms on the system in vogue in that province of farmers placing chattle mortgages on the growing crop. The practice has given rise to a deal of trouble and annoyance in handling grain at shipping points. Dealers and elevator owners at these points this past autumn, in many cases were served with notices from agricultural implement firms, warning them that they had chattle mortgages on the crops of farmers named in accompanying lists, and further, that in case the dealer purchased any of this wheat, the payments therefor were to be made to the firms serving notice. "It is quite apparent," says Mr. Atkinson, "that it is an impossibility for the street or elevator buyer to recognize the identity of mortgaged wheat from the free article; the whole grain arriving in wagon or sleigh loads without any distinguishing mark; buyers have no means of knowing who is the owner of the wheat presented to him for sale, beyond the fact that the load is to be paid for in cash to the deliverer thereof. The evil of this system of holding the purchasers of grain, offered in the open market, responsible to the mortgagee, is so great that unless the legislature provides some relief, the trade will be so hampered and the difficulty of purchasing grain so increased, that precautions will have to be taken by purchasers which will increase the cost of handling, and thereby lower prices to producers. It is admitted that the finding of a remedy is not easy, but now that the evils of the system have become so apparent it is to be hoped that the legislature will find means of meeting the difficulty."

A NEW WHEAT ERA.

C. WOOD DAVIS, and other statisticians of the United States, have written voluminously on the future of wheat in the United States, placing the date as close as five years in some instances and not more than ten or fifteen years at the longest, when the Republic will of necessity become an importer, and no longer remain an exporter of wheat. The argument finds its support in the rapid increase of population and the further fact that new farming lands in the United States are now nearly exhausted. The Montreal Trade Bulletin, under the heading of "A Future Wheat Era," has given us an article confirmatory of this view. The journal does not place the date of America's annihilation as a wheat exporting country quite as near as some other writers, but by the time the world will probably have swung round its annual circuit of vastness thirty or forty times, it thinks, this new era may have set in. The argument followed out with some degree of completeness is in these words: "At the present ratio of increase in the population of the United States, that country will have stopped exporting wheat within the next thirty or forty years, owing to its augmented food requirements, and the wants of the United Kingdom will likewise have shown a tremendous increase as well as those of Germany and probably France within the same period. It would not be at all surprising if a great future war arose out of rivalry between the great wheat consuming nations, in their anxiety to secure the great outside wheat resources of Asia, Africa and South America, and in view of the great food question of the future, England would be the veriest madcap to dream of ever relinquishing her hold on Egypt, as that country is her only safe road to India, which is destined to become the greatest wheat-producing country in the world. Hindostan as a grower of wheat in the future will be worth more to England than "all the wealth of Ormuz or of Ind" has been to her in the past. Regarding the wheat supply on this continent, as soon as consumption outstrips production

in the United States, then will come Manitoba's grand opportunity, as she will have two suitors for her cereal hand—John Bull and Uncle Sam. Manitoba has therefore, a brilliant future, as she is bound to become the great purveyor of wheat for Europe and America, and it might be to this period that Mr. Van Horne, the president of the Canadian Pacific railway, had reference when he advised the farmers to hold for higher prices about four months ago. This is not intended for a "bull" article on the wheat situation of to-day, although it is safe to say that it will not be long before the extreme force of the present depression will have passed, if it has not already done so, especially if supplies in sight continue to diminish. But in the future period above spoken of, 75c. to 66c. May wheat will be referred to as a dwarf monstrosity. Events all point to Manitoba and Northwest Territories as offering exceptional advantages for land and other investments, as the coming food emergencies of Great Britain and the United States must become Manitoba's crowning opportunity."

EDITORIAL NOTES.

HAIL 1894! A prosperous year may it be to the many readers of the CANADIAN MILLER.

THE first report of this season's wheat crop in Punjab has been issued and is encouraging of India's wheat crop. The area planted shows an increase of 6 per cent. over that of preceding crops.

"BRITISH capital invested in foreign flour mills did not give great returns in 1893. The British syndicate operating in Minneapolis made next to nothing. The British syndicate operating in Rio de Janeiro, Brazil, found their year's business badly dished by the chronic revolution in that turbulent republic. On the whole, milling in distant lands will not pay the London investors." This is the way a milling cotemporary across the line puts this matter of washed-out dividends. But wherein was the capital at fault? Would United States silver dollars, any more than English sovereigns, have created the much-desired profits? We must seek elsewhere for the trouble, and it may be that it has arisen from conditions existent within the walls of the great republic itself.

"IMPURITIES" in wheat take all sorts of forms in some countries. Liverpool, England, Milling, tells of one member of a milling class in that city, who, in a recent meeting, showed "a rather fine collection of foreign coins from various countries, India, Chinese, Turkish, Russian and Roumanian," all of which had been found in the oriental wheats imported into England. Several years ago some English millers found some diamond rings and metal ornaments, along with different varieties of gravel, bits of wood of many varieties, wool, hair, feathers, dried and pulverized camels' dung, clay, sand, leather and outside matter in eastern wheat. These circumstances have produced the facetious comment of a critic: "We were not aware that the orientals were so flush with diamonds, money and jewelery as to be either able or willing to drop them into wheats they sell to the western barbarians."

A FEW months ago we published a letter from Mr. W. R. Mallett, of Exeter, Eng., a prominent miller of that section of country, asking for certain information regarding wheat growing in Canada. Mr. Mallett has been studying, evidently, with a good deal of care the evolutions that have marked the growing of wheat in Great Britain and other parts of the world, and has within the past month delivered a very able address, entitled "The Future of English Wheat Growing" before the Exeter Chamber of Agriculture and Commerce. The conclusions reached by this gentleman are founded on enquiry made by circular and through the trade press at home and abroad, as to the conditions that have influenced wheat growing in these various communities. The address is to be commended for the mass of information it contains bearing upon the important problem of the future of wheat. We hope to publish portions of it in another issue of the MILLER.

MILLERS' VIEWS OF WHEAT.

A LARGE DECREASE IN ONTARIO STOCKS.

WHEAT has taken so many unexpected turns during the past twelve months that it has been no easy matter for farmer or miller to answer the question, as it is sometimes put, Where am I at? Prices have continued to sag, despite an occasional bullish twist given the market now and again; at the same time there has been no small ground for the contention of some that actual stocks on hand do not warrant these repeated slumps, but rather give hope for better prices in the future. With the object of ascertaining with some degree of accuracy the stocks of wheat on hand in Ontario, and conditions in the Province may possibly reflect conditions elsewhere, the Globe a week ago instituted an enquiry on this point.

Those who entertain the opinion that stocks in the Province are smaller than generally supposed, give as one reason that the amount of wheat fed by farmers to cattle this season is a great deal larger than the amount fed last season. Other arguments for higher prices are that the acreage in some sections has been decreased, and also that stocks of wheat in farmers' hands at present are much smaller than they were a year ago. The present ruinous prices have induced many farmers to feed their wheat in preference to sending it to market, and doubtless few would sell it in the present state of the market, unless compelled to do so. It is claimed they can get more profit by feeding wheat. One Western Ontario farmer is authority for the statement that he has this season secured a return of ninety (90) cents per bushel for a portion of his wheat by feeding it, and calculations as to the profit of disposing of wheat in this way in the Western States go to confirm the experience of the Ontario farmer. All the wheat so fed to cattle in Ontario is an important factor in our markets. Usually no allowance is made for the decrease in stocks brought about in this manner, and the visible supply does not show it. But the decrease goes on, and finally when it begins to be appreciated it must result in a higher market.

The method instituted by the Globe to get at the real facts, as far as possible, was the sending out of enquiries to the most reliable millers throughout the Province as to the amount of wheat chopped for feeding, and their estimate of the amount of wheat now held by farmers. In Manitoba, according to recent reports, farmers' deliveries in some sections are now over, and it is said that before the next crop begins to come forward wheat will have to be imported for consumption in that province. In one section of Ontario, more wheat has been fed to cattle this season than has been used for human food. In another section wheat will have to be imported from other parts of the Province, and altogether the amount of wheat fed to cattle so far greatly exceeds that used for human food. In another section wheat will have to be imported from other parts of the province, and altogether the amount of wheat fed to cattle so far greatly exceeds that used for the same purpose last season, while the amount of wheat held by the farmers, as indicated by these reports, is much smaller than held by them a year ago. The reports already received show that the amount of wheat chopped for feeding so far this season amounts to 34,320 bushels, while for the whole of last season the same mills chopped less than 10,000 bushels. It is also shown by these reports that the farmers in the districts covered by them hold 590,000 bushels, against 857,000 bushels a year ago.

The questions asked the millers were these:—

- (1) How much wheat have you chopped for farmers this season for feeding purposes?
- (2) How much did you chop last year for the same purpose?
- (3) What is your estimate of the amount of wheat in farmers' hands in your district at present?
- (4) What is your estimate of the amount held by farmers in your district this time last year?

The replies follow:—

Bowmanville—Two thousand bushels of wheat chopped this year, and over 60,000 bushels of barley chopped; little or no wheat chopped last year; 70,000 bushels of barley chopped last year. There is very little wheat in farmers' hands in this district at present; there

was not more than 5,000 in farmers' hands this time last year.

Another reply from Bowmanville said:—About 200 bushels chopped this season, but expect to chop more toward spring; wheat pretty well sold out by farmers; they held about 10,000 bushels this time last year.

Dundas County—Chopped about 2,000 bushels this season, and 750 last season; farmers hold 4,000 to 5,000 bushels now, against 20,000 to 30,000 a year ago.

Dundas County—Have chopped one car of wheat this season; chopped none last season; very little wheat held by farmers this season or this time last year.

Grenville County—Chopped 2,700 bushels this season, and 3,150 bushels last season; 5,000 bushels now in farmers' hands, against 3,000 bushels a year ago.

Grey County—Have chopped about 300 bushels this season; none last year; amount of wheat in farmers' hands, 2,000 bushels; 20,000 bushels this time last year.

Another miller in the same county writes:—Have chopped considerable this season; cannot give number of bushels; I chopped none last season; amount of wheat now held by farmers very near the same as the amount they held a year ago.

Hastings County—Chopped about 120 bushels this season; chopped 20 bushels last season; farmers in my district hold about 3,000 bushels; held about same a year ago.

North York—Chopped about 300 bushels this season; comparatively nothing last season; farmers hold about 20 per cent. of crop yet; held about the same this time last year.

West York.—Have chopped 500 or 600 bushels this season; chopped less than 100 bushels last season; amount of wheat in farmers' hands now, 25,000 bushels; this time last year 20,000 bushels.

Huron County—About 500 bushels chopped and sold whole for feed this season; chopped very little last season; farmers hold now, say, about 30 per cent. of past season's crop; a year ago they held about 40 per cent. of a smaller crop, or about equal to present stock in total.

Lanark County.—Have chopped none of 1893 crop; chopped not over 200 bushels of production of 1892; the amount of wheat now in hands of farmers certainly not half quantity they held a year ago.

Lambton County—Have chopped about 12,000 bushels since September 1st., 1893; chopped not over 2,000 for year previous to that date; farmers hold not above 40 per cent. of last crop; year ago they held about 60 per cent. of crop.

London—I think there has been more wheat fed to cattle and hogs this season than has been used for human food in this county during the present season; farmers now hold about half as much as they had a year ago; most of the farmers have lost heart in higher prices, they have been disappointed so often during the last two seasons, and have sold.

Leeds County—Chopped none this or last season; wheat now in farmers' hands, 4,000 bushels; not enough for local requirements; amount of wheat in farmers' hands a year ago, 12,000 bushels.

Another mill in Leeds County writes: Chopped more this season than ever before—perhaps 30 tons; this is not a wheat section; butter and cheese are the exports of this county; about half of crop of 1893 still in farmers' hands; we import wheat every year; amount of wheat in farmers' hands this time last year about same as now.

Lincoln County—No wheat raised; none for sale, consequently, none to speak of chopped; not half enough for our own consumption.

Norfolk County—Have chopped, probably, about 500 bushels this season; chopped about 100 bushels last season; farmers now hold about one-third of crop, or about same as they held a year ago; some farmers are holding two or three crops, while tenant farmers are forced to pay rent.

Northumberland County—Only a few are grinding wheat for feed—probably 500 bushels would cover all; I chopped very little last year, unless very light; farmers hold 5,000 bushels now—about same as a year ago.

Another miller in the same county says: Chopped 200 bushels this season; chopped 200 bushels last

season; farmers hold 1,000 bushels now, against 2,000 bushels a year ago.

Simcoe County—Chopped about 200 bushels this season; none last; amount of wheat in farmers' hands now, 25,000 bushels; about the same this time last year.

Perth County—Chopped 2,000 bushels this season; chopped about 500 bushels last season. Farmers now hold about half an average crop; they held about three-quarters of an average crop a year ago.

Peterborough County—Have chopped 500 bushels this season; chopped 300 last season. There is not more than 50,000 bushels of wheat in farmers' hands in this district, against 150,000 bushels, if not more, this time last year.

Port Hope—No wheat chopped here this year or last; about half the crop of wheat still in farmers' hands; this time last year farmers held about two-thirds of the crop.

Simcoe County—Chopped no wheat this season nor last. I think farmers hold one-half of this season's crop, and a year ago they held about half of the season's crop.

Simcoe County—Have chopped 1,500 bushels this season; none last season; 5,000 bushels now in farmers' hands in this district; 10,000 bushels this time last year.

Victoria County—Chopped none of any account this season or last season. Amount of wheat now held by farmers 15,000 bushels, against 40,000 bushels a year ago.

Waterloo County—I have chopped about 2,000 bushels of wheat this season; chopped none last. Stocks in farmers' hands now, 35,000 bushels; a year ago, 50,000 bushels.

Wellington County—Have chopped about 1,000 bushels this season; chopped very little last season. Farmers hold now about 150,000 bushels, probably the same as they held a year ago.

Waterloo County—Chopped 500 or 1,000 bushels this season; chopped about same last season. Farmers in this district hold 30,000 to 40,000 bushels; held about the same a year ago.

Another miller in the same county says: Chopped about 400 bushels this season. Farmers hold about 15,000 bushels against about 12,000 a year ago.

Wellington County—Chopped about 2,000 bushels this season, and 500 bushels last. Farmers now have not more than half as much wheat as they held a year ago. There is some old wheat held over from last year, but the new crop is not so good and the price being very low they are consequently feeding it. The acreage has also been decreased. This last fall there was much less wheat sown than in former years.

Since the reports above were placed in type, additional reports have been received from Durham, Bruce, Renfrew, Dundas, Victoria, Elgin, Simcoe, Huron, Middlesex, Haldimand, Essex, Dufferin, Grey and Oxford counties, which go to confirm what the earlier reports showed (a) that more wheat is being chopped this year than last, (b) that the wheat held in farmers' hands at the present time is considerably less than for a corresponding period last year. For example, Haldimand estimates 30,000 bushels in farmers' hands, against 60,000 a year ago; Victoria, 4,000, against about 10,000 last year; Renfrew, 30,000 bushels now, against 70,000 bushels this time last year; Darlington Township in Durham county, 5,000 bushels in farmers' hands where there were about 20,000 bushels in the same township a year ago.

SEEK THE ADVICE.

WHEN the average miller goes to buy a boiler, if the kind of fuel to be used has been considered, also the distance the boiler must be transported, the conveyance available, also the space in which the boiler must lie when "set up," then he knows pretty near what kind of a boiler he wants and what kind he doesn't want. The advice of a careful, conscientious and practical engineer of experience in such a case is worth more than the boiler, and if sought and heeded, would in many cases, save the miller more than the price of the boiler.



Office of the CANADIAN MILLER,
January 20, 1894.

THE GENERAL SURVEY.

THE one story of continued and intensified depression exists in wheat. According as the question is viewed such is the explanation given for these conditions. The result is that little trading is being done and there is not much hope of an early revival. And yet the bears are not having it all their own way. Ever and anon some theory is advanced that prices will be better soon, and hope once more takes possession of investors. A lengthy article on another page pointing to a very certain decrease in wheat stocks in farmers' hands in Ontario will be read with interest, and will help to strengthen expectations of the future.

Of the local situation in Manitoba the Winnipeg Commercial says: "The local situation has not improved as to the amount of business doing, but rather the contrary. Deliveries of wheat in Manitoba country markets have probably averaged under 20,000 bus. per day. Stocks in store at our lake ports (Fort William and Port Arthur) for the week ended January 6th are placed at 1,598,645 bushels, and a year ago were 2,395,574 bushels. Receipts at lake ports were 46,252 bushels and no shipments. At the annual meeting of the Winnipeg Grain Exchange this week the following estimate was made of the 1893 crop of Manitoba and adjacent wheat region to the west, in Assiniboia territory:

Shipped East, as wheat and flour.....	7,500,000
In store, West.....	2,000,000
In farmers' hands for sale.....	2,500,000
Required for seed and food.....	3,000,000
Total Crop	15,000,000

This estimate, it will be seen, leaves only 2,500,000 bushels in farmers' hands, above home requirements. Stocks now at lake ports are included in the quantity shipped east. Inspection returns at Winnipeg for six months ended December 31st last, show that 53 per cent. of the crop graded No. 1 hard, over 30 per cent. graded No. 2 hard or other grades equal to No. 2 hard and 16 per cent. No. 3 hard and under. This shows the fine average quality of the crop."

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—White, 57c.; spring, 58c.; red winter, 57c.; goose, 54c.; spring, Midland, 59c.; No. 1 hard, 75c.; No. 2 hard, 73c. The Grain Trade Bulletin of the Dominion Millers' Association reports: "Ontario wheat: Ontario fall wheat, hardly anything offering. Holders asking 59c. straight for fall, and 60 to 61c. for spring. Manitoba: Have been buying No. 1 hard 73½c. west, and 75½c. east, but no No. 2 hard, prices too high. Holders are generally asking one cent higher. Offering more freely all rail. Holders asking 77c. for 1 hard, and 75c. for 2 hard, via. North Bay. Also buying grinding in transit, 1 hard 79c.; 2 hard, 77." Montreal: The movement is small. No. 1 hard, Manitoba, 71 to 73c.; No. 2 do., 70 to 71c. Chicago: January, 59½c.; May, 64¾c.; July, 65¾c. Toledo: 59½c. for January; 64½c. for May; 66c. for July. St. Louis: 56¾c. for January; 57¼c. for February; 61¼c. for May; 62¾c. for July. Duluth: No. 1 hard, 60¼c. for January; 62¾c. for May; No. 1. northern, 59c. for January; 63½c. bid for May.

BARLEY—Toronto—Malting grades very dull. No. 1 is quoted nominally at 42 to 44c. outside. Feed is in fair demand for shipment to Montreal and Quebec at 37c. west and 38 to 38½c. east. Of the American markets a despatch says: At Buffalo—The market rules weak, except for the fancy grades, which are not in large supply and are firmly held. Prices are not quotably changed, but buyers of round lots could get a fair shading off present figures, which are about as follows: Good to choice western, 63 to 67c.; fair to good, 55 to 62c.; inferior grades, 46 to 55c.; state, 6-rowed, 68 to 73c.; fairly choice lots are quotable at 70c. At Milwaukee—

Market quiet; No. 2 spot and January 49c.; February 50c.

OATS—Toronto—Mixed and white quoted at 35c. A round lot of Manitoba oats was bought North Bay, at 37½c. Buffalo: No. 2 white sold at 33½c.

PEAS—Toronto—North and west, 52 to 55½c. is being offered.

RYE—Toronto—Offerings light and prices steady. 45c. offered for car lots east.

BUCKWHEAT—Toronto—A fair demand. 46 to 47c. is being bid. At these prices purchases, it is said, can be made for export to Germany.

THE FLOUR MARKET.

IT cannot be said that flour is to any measurable extent brightening up. Trade is slow. Some little is going forward for export, but only a little. The word is that the supply of flour from this side of the Atlantic is in excess of the demand, and the report of the Northwestern Miller is that further large consignments from America are going forward, shippers having, in some cases, dropped 2s. per sack in the last fortnight, without attracting business, for spot values are still much the cheaper. Of Minneapolis trade the Northwestern says: "The sales of flour are not in accordance with either the capacity of our mills or with the production. Nobody would have thought that the Christmas holidays would not clear the stocks and the present over supply is unexpected and highly discouraging. Our hope, that fine sorts would meet an increased inquiry failed. Now we would be satisfied even with a regular demand, but consumption is under the normal level. Export business? This expression has become quite unusual here. It is a hard blow to our patriotic sentiments to be obliged to say again that not a single cargo was shipped. It is true, little parcels are going abroad, more consignments than sales, but these are no exporting trade, but merely trials, only good for teaching our millers that the American competition excludes the possibility of a fair result. Feedstuffs were easier, probably owing to the unseasonable temperature."

PRICES OF FLOUR AND MEALS.

TORONTO.—Car prices are: Flour (Toronto freights)—Manitoba patents, \$3.75; Manitoba strong bakers, \$3.50; Ontario patents, \$3.10 to \$3.20; straight roller, \$2.70 to \$2.75; extra, \$2.40 to \$2.50; low grades, per bag, 95c. to \$1. Bran—\$15.50. Shorts—\$16.50. The Flour and Trade Bulletin of the Dominion Millers' Association says: "Sales: Straight grades, \$2.70 to \$2.75, and 90 per cent. patents at \$2.70 to \$2.85, \$2.90 and \$2.95, f.o.b. for Lower Provinces. Bran, \$12.25 to \$13.00. Shorts, \$15.50 and \$16.00. Bran sold \$17.25, Montreal freights. Export sales reported of straight grades at \$1.23 per 100 lbs."

MONTREAL.—Flour is moving very slowly, and prices are in favor of buyers. Winter wheat, \$3.60 to \$3.80; Manitoba patents, best brands, \$3.60 to \$3.70; straight rollers, \$3 to \$3.10; extra, \$2.90 to \$3; superfine, \$2.60 to \$2.90; Manitoba strong bakers, \$3.40 to \$3.60; do., best brands, \$3.50 to \$3.55. Oatmeal is moving slowly at unchanged prices, demand being of a purely local character. Standard, bags, \$1.95 to \$2.05; do., bbls., \$4.20 to \$4.30; rolled oats, bags \$2; do. bbls., \$4.20 to \$4.25.

SPlicing WOVEN BELTS.

MACHINERY, an English journal, furnishes the following: Everyone who has had any experience in the splicing of that class of woven belts which are now in such extensive use, is fully aware of the great difficulty which exists when it is necessary to piece them. The most common practice is to join the two ends by malleable iron fasteners, which are fitted with screwed shanks on which nuts can be placed. In what, is, perhaps, the most successful of these arrangements, the ends are turned up and belted together in this way. But it is obvious that, whatever may be the merits of such an arrangement, it is calculated to throw the belt out of balance while it is running, owing to the addition of weight at one point. This has not been objected to hitherto because of the general effectiveness of the fastening, but it is quite clear that a method which, while equally effective, is free from the fault named, will

be of considerable value. Such a method has been introduced by an enterprising firm, who proceed by splitting the ends of the belts by suitable means. In lieu of this the belt may be woven in layers at the point where it is desired to join it, but this, of course, implies a foreknowledge of the length of belt to be required. Having obtained the necessary division, however, by any means, two of the four plys of tongues formed are cut away, and the two ends are then fitted into each other. Thus the finished joint is of practically the same thickness and weight as the rest of the belt. By means of suitable cement and glue, a perfect union is obtained, but it may be made more secure by the employment of laces, wire threads, or rivets. It is claimed that the belt pieced is not only as strong at the joining as any belt pieced in the ordinary method, but that, being of an even thickness throughout, it is in a truer balance, which in high speed machinery is a matter of some importance. The perfect interlocking of the two ends enables a secure fastening to take place, which renders the belt equal in strength at this point to any other portion of it.

MILLING IN GREAT BRITAIN.

THE year 1893 was not a cheery one for the flour-millers of Great Britain thinks the Miller, of London, Eng. "Taken as a whole," says the Miller, "it has been a year of persistently drooping prices, both in wheat and flour. It is not probable that all the great merchant mills of the United Kingdom have in the past year recouped entirely the losses of 1892; no doubt the lines of the smaller mills have been cast in pleasanter places. A miller of moderate capacity is to a certain extent free from the risks that are bound up with every large granary. He may safely live from hand to mouth, replenishing his wheat store with a strict eye to the latest quotations. Millers of this type no doubt enjoyed many months of comparative prosperity, on account of the high price of bran and pollard, products that reached exceptionally high prices. On the other hand, our scanty harvest had the natural effect of raising the value of native wheat, and without English wheat at a moderate price many country millers are in a quandary. As regards foreign flour, the importation has continued very much on the lines of 1892. It is noteworthy that the inflow of United States flour for the months from July 1st to October 31st, surpassed that of the corresponding period of the preceding year, amounting to 6,412,904 barrels, against 5,820,000 barrels. The former item is, we believe, the heaviest total of American flour imported in any four months of any year."

HIGHLY COMPLIMENTARY.

WHEN Mr. John A. Reinhardt, the manager for Washington Territory of the Northwestern Mutual Life Insurance Co., was spending his holidays a few weeks ago with friends in Strathroy, he took a policy on his brother with the Ontario Mutual Life Assurance Co., on the twenty payment life, twenty year survivorship distribution plan. On the receipt of the policy he wrote to the company's agent as follows:

"DEAR SIR,—Your favor enclosing my brother's policy was received this morning; accept thanks. I have read it over carefully and am entirely satisfied with the contract. It is just as you represented it, and strikes me as extremely liberal—but not too much so.

"For a young man I think it is the best policy written, and I believe your company writes the best contract on that plan offered to the insuring public to-day.—I am, yours respectfully,
J. A. REINHARDT."

Spokane, Wash., Sept. 7th, 1893.

THE WAY IT LOOKS.

A WRITER on the care of engines says it looks like pure laziness for a man to plant certain pieces of bright work on an engine because a little extra work is required to keep them bright. It does look that way. Moreover, a man who will shirk work in that way will probably shirk in every other way he can get a chance.

THE poet who speaks of "the fluffy hair of the miller's daughter" may be treading on dangerous ground. The suggestion seems to be that the miller employs his daughter in the mill, and that she's too lazy to comb her hair.

BY THE WAY.

IT is a matter of regret to the publisher, that an unlooked-for accident has delayed work in the mechanical department of the office making it desirable that the size of the MILLER this month should be reduced to ensure the prompt publication of the February issue in regular, and we hope, improved form.

x x x x

The exports of Manitoba wheat, according to the president of the Winnipeg Grain Exchange, are not distinctly shown in the trade and navigation returns of Canada. The exports in the main, it is claimed, are accumulated at Fort. William, in this Province, and Ontario really gets credit in the government returns for exporting the grain grown in Manitoba and the Territories. As an instance of how this works out, it is stated that for the year ending the 30th June, 1893, the wheat exports of Manitoba are given as 401,000 bushels, though probably 6,000,000 actually went to Europe. The Manitoba customs officials are powerless in the matter.

x x x x

No one knows better than American maltsters the marks of really first class barley. They are judges. Referring to the relative value of American and Canadian barley the Commercial, of Buffalo, says: "The barley raised in a small district in the Province of Ontario is distinctly better than any other, and the reason may be found in the peculiar soil found in that region, probably in the underlying limestone. The proof of the superiority of the barley may be found in the testimony of the maltsters and brewers of this State, and also in the decisive fact that Canadian barley fetches in the American market 10 to 15 cents a bushel more than its American rival. Facts are facts, and there is no sense in blinking them."

x x x x

Opinions differ. On another page we publish the opinions of a number of millers in various parts of the Province regarding the quantity of wheat in farmers' hands. The consensus of opinion there expressed points to a smaller quantity of wheat on hand at the present time than at same time a year ago. This, however, is not the view held by Mr. H. Stevens, of Aylmer, who says there is lots of wheat in the country. One farmer he knew was holding 1,800 bushels, and there has not been as much fed as some think. Besides, mill owners and grain men were holding large stocks. As an illustration, he said that in their mills in Chatham they were carrying 200,000 bushels. He thought the amount held by the farmers was fully as much as that held by them at this time last year.

x x x x

Mr. John B. Riley, Consul General of the United States at Ottawa, has forwarded to the State Department of Washington his reply to the circular recently received by him asking for information as to the consumption of wheat and flour in Canada. He states that the standard of living in Canada is practically the same as in the United States, and that the same quality of flour is used. Canada is essentially a wheat producing country, and the importation of American wheat and flour are only nominal. For the year ending June 30th, 1892, Canada imported 66,113 bushels of wheat, 66,105 of which came from the United States, and 36,557 barrels of wheat flour, of which 34,338 came from the United States, and during the same year Canada exported 8,714,154 bushels of domestic wheat, of which 1,489,881 bushels were sent to the United States and 380,996 barrels of domestic wheat flour, of which 3,998 for the United States. Taken together, these figures show that the United States affords a market for Canadian wheat and wheat flour rather than the converse. Marshall P. Thatcher, United States Consul at Windsor, Ont., answers the question, what are the prospects of extending the trade in wheat flour in Canada by saying: "I can answer this more intelligibly when Congress disposes of the Wilson tariff bill."

JOYNER & ELKINGTON, of the Qu'Appelle Valley mill, Qu'Appelle, N. W. T., have recently put in a new steam plant and made other improvements.

STEAM PUMPS



Duplex AND SINGLE Steam AND POWER Pumps



If you require a pump for any duty, of the latest and most improved pattern, and at close prices,

WRITE US



NORTHHEY M'FG CO.

LIMITED

TORONTO - ONT.

T. R. WADSWORTH ESTATE TENDERS

— FOR —

Leasing Weston Mills

WESTON, ONTARIO

— AND —

FARM PROPERTIES

THE TORONTO GENERAL TRUSTS COMPANY, Administrators with Will annexed of the Estate of the late Tom Rodney Wadsworth, will receive Tenders up to THURSDAY, THE 15TH OF FEBRUARY, 1894, for the leasing for a period of five years the well-known and valuable Flour Mills with complete roller system, known as

Weston Mills, Weston, Ontario,

with the land and premises attached thereto, excepting the Residence and Grounds and Cottage opposite, formerly occupied by the late Mr. T. R. Wadsworth.

The Mills are situate on the Humber River, at Weston, and are worked by never failing water power. In connection with the Mills there are a Brick Office, two Dwelling Houses, a number of Sheds and other Outbuildings.

An extensive and lucrative business has been carried on for the past 65 years, and a good connection has been formed.

TENDERS

Will also be received up to THURSDAY, THE 1ST DAY OF MARCH, 1894, for the lease for five years of the whole or portions of the following farm Properties, regard being had to the buildings situate thereon: South half Lot 24, Lot 23, East half Lot 22, and the East 20 acres of lot 21, Concession B, Township of Etobicoke; also those parts of Lots 22 and 23 lying eastwards of the Concession Road between Concessions B. and C. of the said Township, and extending to the roads known as Scarlett's Road and Wadsworth's Lane, excluding thereout and therefrom the said Scarlett's Road and Wadsworth's Lane, the Lands comprised in St. Phillip's Church and Parsonage grounds, the right of way of the Grand Trunk Railway and all other public roads; the whole containing about 228 acres more or less.

Possession of the Mill Property may be had on the 1st day of March, and the Farm Properties on the 1st of April next.

Parties tendering for the Mill Property may also tender for the whole or any portions of the Farm Properties, regard, however, being had to the buildings thereon.

The highest or any tender not necessarily accepted.

For viewing the premises, apply to MR. CHARLES WADSWORTH, at the Mill's Office, on Mondays, Wednesdays and Fridays, between the hours of 10 a.m. and 6 p.m., and for Plans of the Property and further particular apply to him, or to

The Toronto General Trusts Co.

ADMINISTRATORS,

Cor. Yonge and Colborne Sts.,

January 16th, 1894.

Toronto.

THE NEWS.

CANADA.

—1,539,107 bushels of wheat are in store at Fort William.

—The new grist mill at Marquette, Man., is now running.

—The Baldur Farmers' Elevator Co., Ltd., incorporation granted.

—Ball & Knox, flour and feed, Brandon, Man., sold out to Parish & Lindsay.

—The first grain shipment from St. John, N. B., will be carried by the steamship "City of Lincoln."

—A loss of \$1,000 was sustained by fire at Campbell's flour mill at West Toronto Junction a week ago.

—Thos. Scott, a miller in the employ of the McKay Milling Company, Ottawa, dropped dead on Christmas evening. He was 65 years of age.

—A lot of wheat damaged by water at Amherstburg, Ont., recently, was sold to the Brantford Starch Works at 22½ cents per bushel.

—Preston & McKay, millers, of Boiesvain, Man., are to dissolve partnership in May next, and the mill property is to be offered for sale in February.

—Owing to the death of C. J. Smith, of the firm of Smith & Brigham, millers, Moosomin, Assa., the mill has been closed, pending an adjustment of the estate.

—The mill property at Arden, Man., has been sold to Mrs. L. Moore, wife of one of the late partners. Mr. D. Moore will manage the mills, assisted by an experienced miller.

—At the annual meeting of the Winnipeg Grain Exchange held on 11th inst., S. A. McGaw, manager of the Lake of the Woods Milling Company, was elected president, D. G. McBean, vice-president, and C. N. Bell, secretary.

—Mr. Joseph Gauthier, of Armagh, Que., met a fearful death a day or two ago in a mill to which he had gone to have some grain ground. Having gone too near the machinery he was caught and drawn into it until his body was chopped into mince meat, which clogged the mill and stopped the machinery.

—Our old Ontario citizen and ex-president of the Dominion Millers' Association, Mr. Ed. Peplow, in renewing his subscription to the CANADIAN MILLER, which he says, "I cannot get along without," adds, "We have got our mill going again after a thorough re-building and it is very much improved." Mr. Peplow is manager for George McCulloch & Co., who carry on large flour and woolen mills at Rapid City, Man.

—Taking the Winnipeg inspection as the basis for testing the quality of the 1893 crop, the result is eminently satisfactory. The percentages for the six months ending 31st December, were: No. 1 hard, 53%; No. 2 hard (including 1 Northern, and 1 White Eye, which are of about equal commercial value) 30¼%; No. 3 hard (including No. 2 Northern, No. 2 White Eye and No. 1 Spring, of about equal value) 6¼%; leaving but 10% for lower grades of wheat.

GENERAL.

—Five mills which have been turning out Superior's heaviest flour product the past season have been forced to shut down because high all-rail rates to the east were inaugurated January 1st.

—"The situation in Russia," says the London (Eng.) Miller, "continues to be discussed, and there are general divergencies of opinion to be dealt with. The light weight of the wheat crop of 1893 is now conceded, and a mean weight of 55 pounds to the bushel, where 60 pounds had been assumed, amounts to a diminution of one-twelfth on the whole. This

would be, roughly speaking, equivalent to 4,000 quarters."

—A late despatch from Tacoma, Wash., says: Between 12,000,000 and 15,000,000 bushels of wheat have been destroyed in the wheat districts of Eastern Washington, by continued rains. In 1892 the yield from that district was 12,000,000 bushels. In 1893 the acreage was increased and it was expected the yield would reach 15,000,000 bushels. A party of large wheat land owners have returned from the wheat belt and report that the farmers would have been better off if they had not planted any wheat last year. Many thousands of bushels rotted in the field, but the rains have continued up to date and have flooded the granaries and destroyed most of what was harvested and rendered the roads impassable.

A SHAMEFUL MILLER.

ANY man capable of writing a letter so thoroughly execrable and vile as the letter which here follows, written by a member of the firm of Band & McDonald, millers, Baldur, Man., deserves to have his name made known the country over in order that decent men may shun him as they would a pestilence. It can be easily understood that the lawyer did not get after such a man any too soon. We give the letter verbatim et literatim, that the man may be seen in all his villainy, and may see himself, too, and, possibly, believe it is time to seek conversion.

Baldur Jany 1894. Mr A. G. Mortimer Publisher Canadian Miller & grain trade Review. Enclosed you will find your lawyers letter Demanding Past Due subscription. there was a firm of millars at Pilot mound By that name i as one of the Partners never was aware of us subscribing to your Paper it came acasional Have not seen it now for about a year but enclosed you will amount asked for for and i want you in future to stop sending out a paper to us as its not worth Half what you ask for it we are running a mill at this place but Dont want you to Dirty our mill with your Damn Dirty Paper In the first place we never Wrote for it never changed the address ask you to stop it 2 years two years ago so stop god Damn Paper this time god Damn you and your filthy paper.

It is fair to say that after completing the letter the writer either forgot, or was ashamed, to affix his signature. We are for this reason unable to say which partner is the author of the epistle.

MIX THE MOVEMENTS.

DOUBTLESS many of our readers, who are not experienced engineers, may have noticed that frequently the oscillations of the main belt in a mill come in unison with the beat of the engine, and a perceptible slapping about of the belt is noticeable. The beat of an engine will often come in sympathy with the sway of the building, and so increase it as to be very perceptible. If this were continually going on in exact time it would become so great in time as to be dangerous, but one or the other gets ahead and mixes the movement, so that it gradually ceases until they are again unison. If the speed of the engine is changed in either case the swaying will be kept mixed all the time instead of occasionally. On long lines of shafting this will appear also, the pull on the belt at the commencement of the stroke being in unison with the spring of the shaft, thus causing a marked oscillation. The same remedy is applied here—to mix the two movements purposely—and the trouble is partly, if not entirely, removed.—Machinery.

IMPORTANT SALE OF MILL PROPERTY.

We call attention to the advertisement which will be found in another column, of the Toronto General Trusts Company, the administrators of the late T. R. Wadsworth's estate, offering for lease the well-known and long-established mills known as the Weston Mills, together with the farms adjacent.

PERSONALS.

Mr. John Goldie, of the firm of Goldie & McCulloch, Galt, with Mrs. Goldie and family, have left on a pleasure trip to Alexandria, Egypt, and will probably spend the next four or five months sight seeing in Egypt and Palestine.

The name of David Goldie, the big miller, of Ayr, Ont., is prominently mentioned as a candidate for the Local Legislature. It is men of Mr. Goldie's sterling character, who are to-day needed to occupy a place in our legislative halls. Capable and shrewd as a business man, of undoubted integrity, clear and level-headed in judgment, and withal a man of unblemished character, noble and pure in all his aspirations and motives, the constituency might well pray that Mr. Goldie will see his way clear to become a candidate.

On the morning of 8th inst. there died a very old resident of the Township of King, at his residence, lot No. 26, in the fifth concession, in the person of John Spink. He came to Canada from Yorkshire, England, in the year 1826, and settled in the township of King about 68 years ago. Some six years afterwards he located on lot No. 26, then a bush farm, where he has resided ever since. He was one of the early pioneers who went out into the wilderness and helped to make the country what it is now. He was possessed of a vigorous constitution, and scarcely knew what an ache or a pain meant during his whole lifetime. He was a Reformer in politics and a member of the Christian church, and to the last was possessed of all his mental faculties, and died respected by all who knew him, leaving one daughter and three sons, William Spink, and J. L. Spink, the well-known grain merchants, Toronto, and Samuel Spink, Winnipeg, surviving him.

PUBLICATIONS.

The American Miller, of Chicago, entered its twenty-second year with January, which was one of the best numbers issued in its long career, and augurs liberal things for the future.

If not too late we would like to complement our contemporary The Northwestern Miller, on the beautiful special holiday number that it has sent forth to its readers. From the point of view of the artist, printer and journalist, it is a number to command rich admiration. The illuminated cover is a capital introduction to the whole interior, giving a fine representation of Robert Burn's "Dusty Miller." The Northwestern is nothing if not enterprising.

WHEAT SPECULATION.

Speculation in its true sense, it has been said, is not a lottery. All business is a speculation. Chances are taken by every merchant in the country in every bill of goods bought. They may make or they may lose. Is not wheat merchandise? How one may speculate in wheat, and speculate, it is believed, within legitimate lines, is told in an announcement of S. H. Wood Produce Co., of Minneapolis, Minn., in another page. This firm takes certain chances on May and July wheat, and having carefully studied all conditions, say to customers, we are prepared to guarantee you against loss to a moderate extent if you buy at present low prices. The custom is not a new one with this house, and the record says that they have in the past been very successful, making money for their clients, as well as themselves. Their "Latest Letter" is deserving a careful perusal.

THE question no longer seems to be: "Can the small mills stay on earth?" It is now somewhat like this: "Can the big mills stay on earth at a profit of less than five cents a barrel on their flour?" The small miller seems to be in a better condition than his gigantic neighbors nowadays.

WANTED AND FOR SALE

Advertisements will be inserted in this department at the rate of 15 cents per line each insertion. When four or more consecutive insertions are ordered a discount of 25 per cent. will be allowed. This notice shows the width of the line and is set in Nonpareil type. Advertisements must be received not later than the 27th of each month to insure insertion in the following issue.

ONE FIFTY H.P. CONDENSING INGLES Corliss Engine, Pump, Boiler and Stack. One Centrifugal Reel (Galt make). One Centrifugal Reel (Stratford make). One Upright Bran Duster (Galt make). Two Purifiers. All as good as new for work, at very low prices. Further details from

W. B. BRAGG, Rockwood, Ont.

MILLER WANTED

WANTED, A GOOD MILLER TO MANAGE a 75 barrel mill. Must be competent man and single. Address

A. LAPOINTE,
St. Justine de Newton, Que.

SITUATION WANTED

BY MILLER, 4½ YEARS' EXPERIENCE. Young, single, industrious and strictly temperate. Uses no tobacco in any way. Best of references. State wages when writing. Good mill. Address:

JNO. FORD, Jr., Markdale, Ont.

WATER WHEELS WANTED

WANTED, A LEFFEL TURBINE WHEEL from 30 to 36 inches in size, to run against the sun, if possible; also a square gear, about 7 in. face (36 in. to 48 in.) and pinion to match, four or five pairs 18 in. to 24 in. in size. Address:

E. M. POITRAS,
Belle Rivière, Que.

FOR SALE.

A LIMITED QUANTITY OF HICKORY half-round hoops, suitable for barrels for the West India trade. Inquire of

JOHN CAMPBELL,
Erie Mills,
St. Thomas, Ont.

FOR SALE

BUCK WHEAT-FLOUR MACHINERY, ONLY run two years, reason for selling, want of room. Machinery can be seen running. Will take buck wheat flour in payment. Apply to

JOHN MACKAY,
Caledonian Mills,
Bowmanville.

FOR SALE

I OFFER A SEVENTY-FIVE BARREL ROLLER mill, very best modern machinery, engine and boiler complete, in best hard wheat region in the United States. Railroad point, near Manitoba boundary, and largely settled with Canadians. Excellent chance. I own by accident, and sell because not a miller. Terms easy.

C. M. HERTIG,
Box 382, Minneapolis, Minn.

FOR SALE

ONE DOUBLE SET, 9 x 18 in. ROLLS, (Greys' make). One Double Set, 9 x 18 in. Rolls, (Goldie & McCulloch make). Two Inter-Elevator Flour Bolts, 8 feet by 33 inch cylinder. Two Round Scalpers, 3 feet by 20 inch cylinder. One Purifier, No. 1 (Barter make). One Eureka Smut Machine, No. 1. One Oat Separator, No. 1. One 36 inch Water Wheel (Leffel), and a quantity of Shafts, Pulleys and Gears.

The above machinery is as good as new, and will be sold cheap, for cash. Apply

DOBSON & CAMPBELL,
Beaverton, Ont.

TO MILLERS

FOR SALE

"NATIONAL ROLLER MILLS," BRUSSELS, Ont.; capacity 100 barrels per day. Cheap, easy terms of payment. Address

"B.C.," P.O. Box 566, Toronto.

FIRE PROOF
ROOFING
ILLUSTRATED CATALOGUE FREE
METALLIC ROOFING CO.
MANUFACTURERS, TORONTO

BUCKETS

SALEM AND SEAMLESS STEEL
BOLTS CORRUGATED AND PLAIN

CONVEYORS

LINK BELT AND CALDWELL

LINK BELTING

LARGEST STOCK. PROMPT SHIPMENT. CLOSE PRICES.

WATEROUS, BRANTFORD, CANADA

STEAM BOILER INSPECTION AND INSURANCE DEPARTMENT OF THE STEAM BOILER AND PLATE GLASS INSURANCE COMPANY

JAMES LAUT, MANAGER, OF CANADA

- DIRECTORS -

E. JONES PARKE, Q.C.

PRESIDENT.

F. A. FITZGERALD, ESQ., President Imperial Oil Co., VICE-PRESIDENT.

HON. DAVID MILLS, Q.C., M.P., Ex-Minister of the Interior.

JOHN MORISON, ESQ., Ex-Gov. British America Assurance Co., Toronto.

T. H. PURDOM, ESQ., Barrister, London.

J. H. KILLEY, Consulting Engineer.

JOHN FAIRGRIEVE, Chief Inspector.

HEAD OFFICE: MASONIC TEMPLE - LONDON, ONT.

AUTHORIZED CAPITAL, \$500,000 SUBSCRIBED CAPITAL, \$200,000

FULL GOVERNMENT DEPOSIT.

When were your Boilers last inspected by a competent engineer? Do you know what pressure your Boilers can safely stand? Is your Steam Gauge registering the correct pressure? Are your Water Gauges free and in good working order? Is your Safety Valve working properly?

DO not trust to luck; the unexpected generally happens. Avoid the calamity of an explosion. Protect life and property by taking out one of our Inspection and Insurance Policies.

35 CENTS BUYS FISHER'S GRAIN TABLES

The book contains more valuable information and useful tables for Farmers, Millers, Traders and others than any similar book of its kind ever published, besides being a complete Ready Reckoner showing the value of articles or lbs. from one to 500; from a quarter of a cent to \$2.00. Also tables for Grain, Hay, Rent, Board, Wages, Interest, etc.

Write for sample copy.

THE CANADIAN MILLER,
Toronto, Ont.

... THE ... FLINT & PERE MARQUETTE RAILROAD

FROM

Port Huron and Detroit

Is the Short Line to

SAGINAW AND BAY CITY

(Centres of the vast lumber interests of Michigan)

MT. PLEASANT, CLARE, REED CITY

BALDWIN, LUDINGTON, MANISTEE

AND

MILWAUKEE AND MANITOWOC, WIS.

The last two named are reached by the Company line of Steamships across Lake Michigan.

The line thus formed is a short and direct route from

NEW YORK

MONTREAL

BUFFALO

TORONTO

to ST. PAUL, DULUTH and Pacific Coast points.

Write either of the undersigned for Folders, which contain Maps, Train Schedules and much information of value to those contemplating a trip to any of the above-mentioned points.

W. H. BALDWIN, JR., W. F. POTTER,
General Manager. Gen'l. Sup't.

A. PATRIARCHE, Traffic Manager.

GENERAL OFFICES: - SAGINAW, MICH.

MILLERS' & MANUFACTURERS' INS. CO.

ESTABLISHED - 1885

32 Church Street, Toronto

The President, James Goldie, Esq., in moving the adoption of the report on the business of 1892, said: I have much pleasure in drawing your attention to the fact that this company has verified, in a marked degree, every expectation set forth in the original prospectus when organized in 1885.

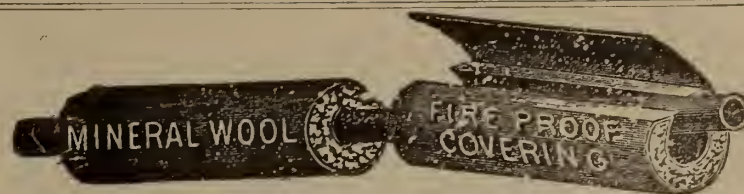
Up to the present time the insurers with this company have made a saving, when compared with the current exacted rates, of \$91,004.20. And in addition thereto bonus dividends have been declared to continuing members amounting to \$21,522.72.

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserved (based on the Government standard of 50 per cent.—(50%), a cash surplus of 1.93 per cent. to the amount of risk in force.

Such results emphasize more strongly than any words I could add the very gratifying position this company has attained. I therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted, and the retiring Directors unanimously re-elected. The Board of Directors is now constituted as follows: James Goldie, Guelph, president; W. H. Howland, Toronto, vice-president; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

HUGH SCOTT, THOS. WALMSLEY,
Mgr. and Sec'y. Treasurer



Mineral Wool Pipe and Boiler Covering

If you want to save fuel

" " " dry steam at long distance

" " " to prevent condensation

" " " " cold water pipes from dripping

" " " " " freezing

USE

MINERAL WOOL

SECTIONAL

COVERING

THE best non-conductor is the cheapest covering. Mineral Wool heads the list as a fire-proof non-conductor. Hard pressed coverings are poor non-conductors, and are therefore the most expensive in the end.

A good pipe covering is one of your best investments. It is false economy to have uncovered pipes, as you are just paying the coal man what the covering man should have, and only ashes to shew for it. Give the matter your consideration, it means money to you.

We also carry full lines of Asbestos Goods, and Mineral Wool for fire-proofing, deadening of sound, insulation, etc., etc. Send for Pamphlet.

CANADIAN MINERAL WOOL CO. LTD., - 126 BAY ST., TORONTO

THOMAS McLAUGHLIN

FLOUR

—AND—

GRAIN

DEALER

210 BOARD OF TRADE BUILDING

TORONTO

EASTERN AGENCY:

50 St. Paul Street

QUEBEC

ARE YOU INTERESTED IN LUMBER?

• SCRIBNER'S
LUMBER AND LOG
BOOK •

Is invaluable to any who have occasion to measure lumber, cast up measurements of timber of any shape, and to farmers and mechanics, without any exception.

THE TABLE ON STAVE AND HEADING BOLTS and the table for casting up price per cord for these is a great saver of time, and always accurate.

Over a million copies have been sold. Post paid to any address on receipt of 35 cents.

Address, A. G. MORTIMER,
Toronto, Can.

FRED. ROPER

Trustee, Accountant, Auditor, etc.

QUEBEC BANK CHAMBERS

2 TORONTO STREET Phone 1714



DUST! DUST!

Gibbs' Patent Dust Protector protects the nose and mouth from inhalations of poisonous dust. Invaluable to operators in every industry where dust is troublesome. Perfect protection with perfect ventilation. Nickel plated protector by mail, \$1.00; postage 5c. Circulars free. Agents wanted. Gibbs' Respirator Co., 36 LaSalle St., Chicago.

C. C. CLEVELAND

G. F. CLEVELAND

J. L. Goodhue & Co.

MANUFACTURERS OF

LEATHER

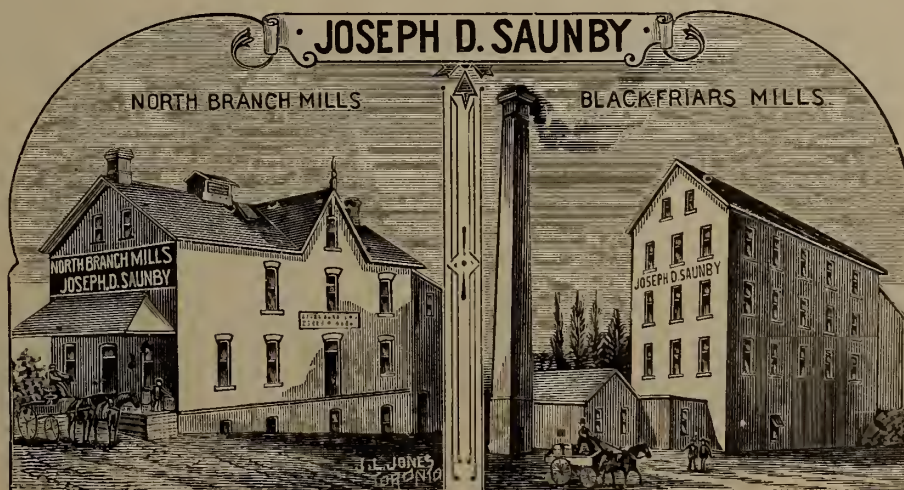
BELTING

AND

LACE LEATHER

DANVILLE, Que.

NEW & 2ND
ILLUSTRATED
CATALOGUE
FREE
MACHINERY
H.W. PETRIE
TORONTO, CANADA



LONDON, ONT.

Manufacturer of

High Grade Flours

Brands:

"ANSONIA"

AND

"GECUMSEK"

Chopped Feed ...

In whole or car lots
mixed

NORTH : AMERICAN : MILL : BUILDING : COMPANY : LIMITED

STRATFORD, ONT.

Line of Machinery WE MANUFACTURE

ALLIS ROLLER MILLS
FEED ROLLER MILLS
PERFORATED STEEL SCALPERS
ROUND REEL SCALPERS
HEXAGON SCALPERS
SEIVE SCALPERS
INTER-ELEVATOR FLOUR DRESSERS
CENTRIFUGAL REELS
BRAN DUSTERS
SHORT DUSTERS
AIR PURIFIERS
SEIVE PURIFIERS
COMBINED DUSTLESS PURIFIERS
GERM ASPIRATORS
MILLING SEPARATORS
CLOSE SCOURERS
BRUSH MACHINES
COCKLE MACHINES
DUST CATCHERS
FLOUR PACKERS
BRAN PACKERS

THE BROWN AUTOMATIC CUT-OFF ENGINES

The Best, most Economical and
Durable in the market

Read what Archibald Campbell, M.P., has to
say regarding his mill :

TORONTO JUNCTION, NOVEMBER 28TH, 1893.

NORTH AMERICAN MILL BUILDING CO.,
STRATFORD, ONT.

GENTLEMEN,

I have much pleasure in informing you that the contract you entered into with me in December last year, to complete a six hundred barrel mill for me here, has been completed to my entire satisfaction.

The mill has now been running nearly four months, night and day, and we have had scarcely a moment's delay on account of anything going wrong with your machinery, while the quality of the flour is giving such good satisfaction that I have been able to dispose of the whole output as fast as made.

The plan adopted of building the mill in two parts—one side for hard Manitoba wheat and the other for soft winter wheat, has been eminently successful, as I am thus enabled to make more even and better granulated flour than could possibly be obtained under the old system of mixing the wheat before grinding.

The capacity of the mill is also greater than we agreed upon (we having turned out nearly seven hundred barrels in the twenty-four hours), while the clean up of the offals and the general run of the flour is the best I ever saw.

I have been in the milling business for a great many years, and have had to do with many different kinds of mill machinery, but I am better pleased with your work than with any other that I have had to do with.

If you complete all your contracts as you have mine, I am sure you will be very successful in mill building.

Yours very truly,

ARCH. CAMPBELL.

WE MAKE Mill Building

A SPECIALTY
NOT A SIDE LINE

Full line of most modern and improved Machinery furnished for Mills of large or small capacity from basement to attic.

Prices as low as any in the market consistent with first-class Material, Workmanship Style and finish.

We guarantee results superior to any that can be obtained from any other line of machinery in Canada.

Estimates, Plans and Specifications cheerfully furnished upon application.

All kinds of Rolls corrugated with promptness and despatch

Dufour Bolting Cloth and Mill Supplies

ALWAYS IN STOCK

North American Mill Building Co., Ltd.

STRATFORD, ONT.

OUR LATEST LETTER

—And a Good One Too.—

Our regular customers are taking hold of May and July wheat in earnest. Will you join in a purchase too?

On August 3rd we made an offer guaranteeing our customers against loss on a purchase of December Wheat. The market has advanced as we predicted, and our customers made money. Now we predict an advance of THIRTY CENTS A BUSHEL IN CHICAGO JULY WHEAT, and IF YOU BUY THROUGH US we will guarantee you against loss on a Moderate Quantity of wheat, if you buy at the present low prices.

To Our Correspondents:

The past two years have been very hard ones for those who have bought wheat, but the market cannot always go one way. We have had two large crops and we under-estimated them. This alone has caused heavy markets, but added to this was the recent financial panic. NOW ALL IS CHANGED. The panic is over, and the world's crop of 1893 is as much over-estimated as was the previous two years under-estimated. Our Mr. Wood, in a short trip to Dakota this week, found fields which promised well, but which the threshing machine give only three bushels per acre.

With all these conditions no one need be afraid to buy wheat, and we shall have such a steady foreign demand all winter, that NEXT SPRING JULY WHEAT WILL SELL IN CHICAGO AT \$1.00 PER BUSHEL. This week it is 66 cents.

THERE IS A PROFIT OF 30 CENTS PER BUSHEL TO BE MADE IN BUYING JULY WHEAT AT PRESENT PRICES, and if you buy through us we will guarantee you against loss.

Our offer to guarantee customers against loss is a new thing in speculative trading, but it is a good thing in many ways, and has proven so for many of our customers.

We commenced making these guarantees in June last, and for two reasons. (1st) The price of wheat was so low that there was no chance of a buyer losing if he holds on. (2nd) We find it the hardest thing in the world to get customers to buy when the market is down. It always looks weakest when it is lowest, and customers are correspondingly afraid to buy until the market advances two or three cents.

BY OUR GUARANTEE SYSTEM OUR CUSTOMERS ARE PERFECTLY SAFE, THEY BUY CHEAPER, THEY MAKE MONEY, AND WE MAKE MORE MONEY.

Our success is bringing us a large trade, and we are working to secure orders for 10,000,000 bushels of July wheat; to that end we are

sending 10,000 of these Market Letters to all the grain buyers, millers and merchants in the Northwest, besides our own regular correspondents. We are receiving orders every day, and are picking up this low priced wheat, which is still selling at panic prices.

Have you money to invest?

Do you want to make money?

Have you ever lost money in the speculative market?

YOU CAN MAKE IT ALL BACK AND MAKE A BIG PROFIT BESIDES, if you will send us an order now for 1,000 to 25,000 bushels of July wheat. Read

Our Special Insurance Offer

To customers who buy wheat at the present prices, we will make the following offer of protection against loss, viz.: To customers buying Chicago July wheat at present prices on a 5 cents per bushel margin, we will furnish any and all additional margins that may be required, and guarantee the customer against loss on July 1st, for \$1.50 per each 1,000 bushels, and 10 per cent. of the profits. This is a very liberal offer, and we do not care to guarantee a larger amount than 500,000 bushels. We would like to give each customer an opportunity to take advantage of this, and only orders of 10,000 bushels or less will be received on this basis from each customer. Everything warrants an advance, and there is nothing to cause a serious break.

Now is the Time to buy

\$ 51.50 buys	1,000 bushels on 5 cent margin.
103.00 buys	2,000 bushels on 5 cent margin.
257.50 buys	5,000 bushels on 5 cent margin.
515.00 buys	10,000 bushels on 5 cent margin.
1,030.00 buys	20,000 bushels on 5 cent margin.

Remember our pointers have been good for months, and we predict a big advance in July Wheat.

Soliciting your orders, we are, very truly yours,

S. H. WOOD PRODUCE COMPANY

GRAIN MERCHANTS

New York Office:

No. 6 WALL STREET

913 and 915 Guaranty Loan Building, Minneapolis, Minn.

•OUR REPUTATION•

READ THE CLIPPING BELOW FROM THE OMAHA DROVERS' JOURNAL

We note to-day an Unparalleled Offer, in which the S. H. WOOD PRODUCE CO., of MINNEAPOLIS, MINN., offers to guarantee customers against loss on a moderate quality of wheat, if they buy at the present low price. Those who have been close readers of the Journal and noted the predictions of this firm on prices, know that they have been very successful in predicting future prices of grain, and their unusually keen foresight and excellent judgment warrants them in making their special insurance offer. Speaking of their recent prediction the Daily Financial News says: "Our readers will remember that the S. H. Wood Produce Company, of Minneapolis, Minn., recommended the sale of Chicago corn, claiming that price was not warranted with the large stock held by farmers undisposed of; corn has since gone down 10 cents per bushel."

PUT A LITTLE MONEY IN THIS VENTURE. IT WILL PAY YOU.

EVERY

PROGRESSIVE MILLER

WILL READ THIS

OFFICE OF
PENN YAN ROLLER MILLS.

PENN YAN,
Nov. 16th, 1893.

PLANSIFTER COMPANY OF CANADA, LTD.,
STRATFORD, ONT.

GENTLEMEN,

Answering your esteemed favor of the 15th inst., would say that we have the Plansifters working in our mills both on wheat and buckwheat. We like the operations of them very much. We think they are at least equal, if not superior, to the most modern round reels. They possess many advantages which the reels do not. They run with very much less power, and the same capacity can be produced in a much smaller space.

The yield and quality of the product we are now getting is much superior to that which we formerly had under the reel system.

We have given them a very thorough trial, and do not believe there is anything equal to them in the way of a bolting device.

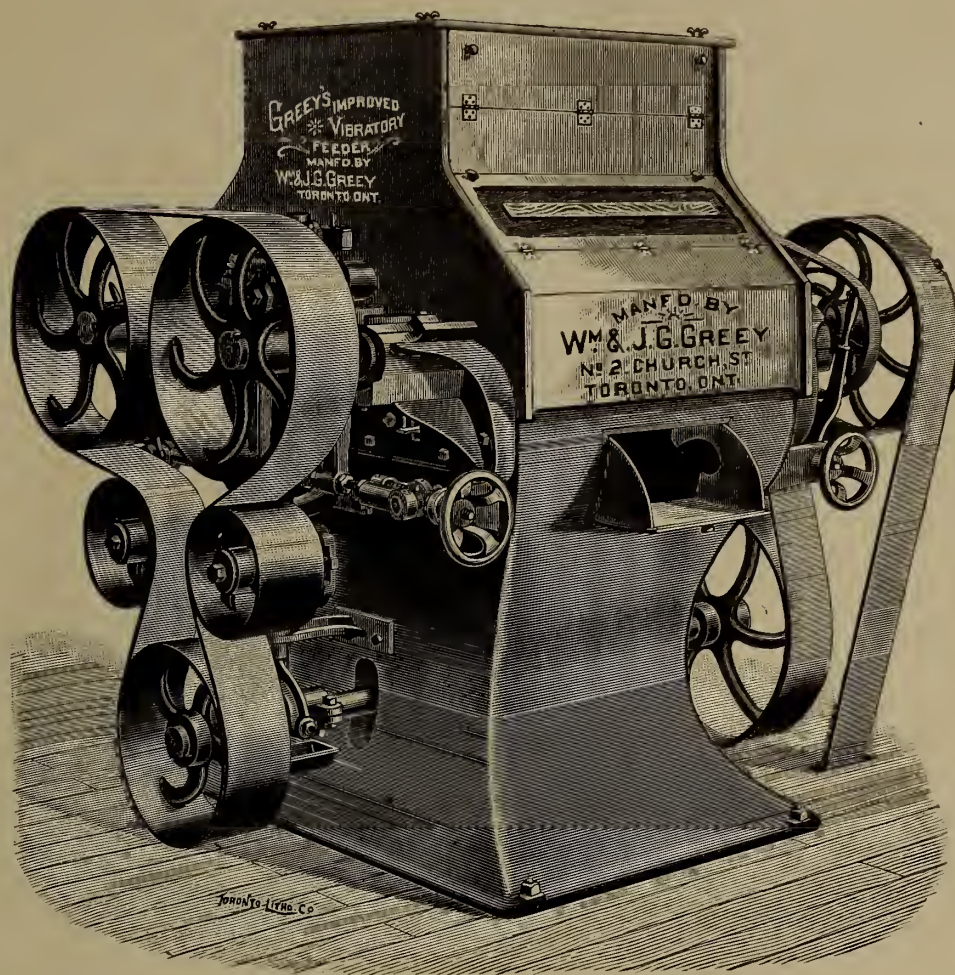
Yours very truly, RUSSELL & BIRKETT.

— FOR FURTHER INFORMATION ADDRESS —

THE PLANSIFTER COMPANY OF CANADA, LIMITED, STRATFORD, ONT.

SOLE MANUFACTURER OF CARL HAGGENMACHER'S PLANSIFTERS : THOUSANDS IN USE

THE BEST IS CHEAPEST



GREEY ROLLS ARE HARD AND TOUGH

ARE ALWAYS IN GOOD WORKING CONDITION

GUARANTEED ABSOLUTELY FREE FROM ANY FLAW
GREEY ROLLS ARE THE BEST

ROLLS RE-GROUND AND CORRUGATED

With the utmost precision. Warranted perfectly true and returned promptly

OUR ROLL GRINDING AND CORRUGATING PLANT

Is the LARGEST, BEST EQUIPPED, and MOST ACCURATE in the country; our stock of
... Corrugating Tools the MOST VARIED ...

NEW CORRUGATING TOOLS OF ANY STYLE MADE TO ORDER WITH THE GREATEST NICETY

WM. & J. G. GREEY 2 CHURCH ST. TORONTO

DICK, RIDOUT & CO.

JUTE AND COTTON

BAGS AND SACKS

OF EVERY QUALITY AND SIZE REQUIRED.

Strict attention given to prompt shipment.

Original Designs for Brands Prepared Free . . . Printing in beautiful Bright Colors at Lowest Prices

SEND FOR SAMPLES
AND PRICE LIST
DICK, RIDOUT & CO., TORONTO, ONT.
**DO
YOU
WANT**

A Life Policy
An Endowment Policy
An Investment Policy
Or an Annuity Policy

THE ONTARIO MUTUAL LIFE
ISSUES THEM ALL

One 20-year Survivorship Distribution Policy embraces all the newest features, and is the best form of Protection and Investment money can buy. It has no equal. Guaranteed values, attractive options and liberal conditions.

A WISE AND GENEROUS PLAN.

Our Annuity Endowment Policy ensures a certain annual income to yourself during 20 years after maturity of the Policy or to your family at earlier death; and the Annuity Life Policy guarantee a sure income to your family during 20 years after your death; first payment immediate. The rates are lower than on ordinary plans.

F. E. DIXON & CO.

MANUFACTURERS OF

Star Rivet Leather Belting
WRITE FOR
DISCOUNTS

70 King St. East, Toronto

COOPERAGE STOCK

If you want

STAVES, HOOPS, HEADING OR LINERS

FOR

Flour Barrels, Meal Barrels, Apple Barrels,
Salt Barrels, Bean Barrels or any other kind of Barrels

WRITE TO **SUTHERLAND, INNES & CO.,**
CHATHAM, ONT.

.... THEY MAKE THE BEST STOCK

1892 MODEL

Remington Typewriter


Unapproached for Excellence of Design and Construction, Quality of Work, Simplicity and Durability.

MACHINES FOR RENTAL

OPERATORS SUPPLIED SEND FOR CIRCULAR

GEORGE BENGOUGH

- 45 -
Adelaide St. East
Tel. 1207. TORONTO

SPACKMAN & CO.

164 St. James Street
Tel. 1189 MONTREAL

BAGS

For
FLOUR
OATS
BRAN
FEED


BAG PRINTING IN COLORS

—A SPECIALTY—

... DESIGNS FURNISHED FREE ...

and the Best Work guaranteed

PRINTING CAPACITY 15,000 BAGS DAILY

HESSIANS or BURLAPS

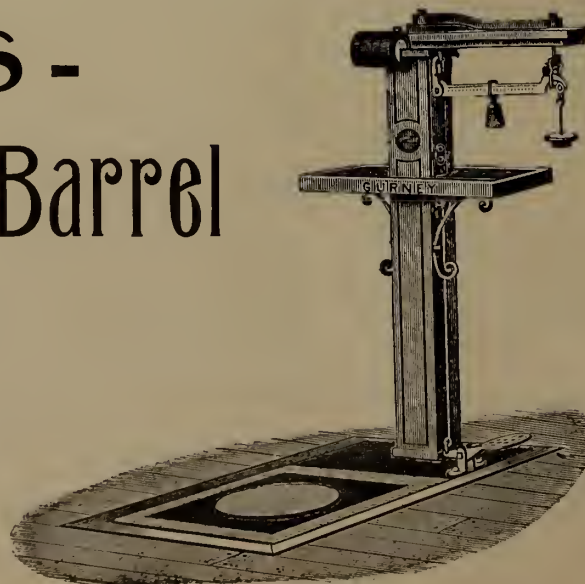
We carry the Largest and Best Assorted
Stock in the Dominion.

THE CANADA JUTE COMPANY LIMITED
15, 17, 19 AND 21 ST. MARTIN STREET, MONTREAL

Toronto Agent: FRANK T. BARR, 48 Wellington Street East, Toronto

- GURNEY'S -
**Flour Bag and Barrel
SCALE**

With Improved Drop Lever



This Scale replaces the old
style of "Flour-Packing
Scale," and is superior to
it in many respects

MANUFACTURED BY

THE GURNEY SCALE COMPANY
HAMILTON, ONT.

Capacity, 600 lbs. Platform, 20 x 28 ins.

NOTE.—We manufacture all kinds of Scales. Write
for Illustrated Catalogue.



NEW SERIES "MECHANICAL AND MILLING NEWS"

OLD SERIES, VOL. XI. } NUMBER 2.
NEW SERIES, VOL. IV. }

TORONTO, ONT., FEBRUARY, 1894

(TERMS, \$1.00 PER YEAR
(SINGLE COPIES, 10 CENTS)

EMBRO OATMEAL MILLS

ROLLED OATS



STANDARD AND.



GRANULATED OATMEAL

..... Made from Selected White Oats

SPECIAL TERMS MADE WITH
FLOUR MILLERS FOR RE-SHIP-
MENT WITH CARLOAD FLOUR

D. R. ROSS, Embro, Ont.

Chatham Wired Hoop Co., Ltd.

Owner of the Patents for the Dominion of Canada

IS now issuing Licenses for the use of
wooden barrel hoops with reinforcing
metal band commonly called "the wired
hoop." These hoops are specially ser-
viceable for high grade cooperage, requir-
ing strength and tightness, such as flour,
meal, cement, etc.



— ADDRESS COMMUNICATIONS TO —

CHATHAM WIRED HOOP COMPANY, LIMITED,

CHATHAM, ONT.

RUBBER BELTING

MONARCH, RED STRIP AND LION BRANDS.

MANUFACTURED BY

(LTD.)

THE CUTTA PERCHA & RUBBER MANUFACTURING CO. OF TORONTO.

OFFICE 61 & 63 FRONT ST. W. TORONTO.

WRITE FOR DISCOUNTS.

FACTORIES AT PARKDALE, ONT.

KENT MILLS

CHATHAM, ONT.

"KENT MILLS"

"THAMES"

"ELGIN"

"SWEET HOME"

"BUDGET"

CORNMEAL

BEANS

Middlings, Bran, Corn, Chopped Feed

AYLMER MILLS

AYLMER, ONT.

High Grade Flour

Second Grade Flour

Low Grade Flour

Straight Kiln-Dried
Granulated Sunrise, Kiln-Dried

Prime Medium
Hand-Picked Medium

SEND FOR SAMPLES
AND PRICES

N. H. STEVENS, Chatham, Ont.

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LEVERAGE IN MECHANICS.

ONE of the strangest hallucinations in this era of advanced thought in mechanics, as in all other branches of practical science, writes Mr. R. James Abernathy, in the American Miller, is that which clings to leverage as a factor of facilitating work in shops, mills and factories. The attention of the writer has been very forcibly called to this delusion, this relic of past ignorance, this shadow of a darkened period that should be left to oblivion and be forgotten, by a recent controversy with another writer. The writer claimed that if one man, by catching hold of the rim of a 36 inch wheel, could revolve the reel or set of reels with which it was connected, seven or eight times a minute, it would require sixteen men to revolve the same reels at the same speed provided a wheel $2\frac{1}{4}$ inches in diameter were used instead of the 36-inch wheel. The ignorance of mechanical lore displayed in this statement is so apparent that we gaze upon it in bewildered astonishment, and wonder how it could have been penned by any writer of to-day, whether of high or low degree.

It is true that but few writers would now make such an awkward blunder as that. That assertion, in connection with many others less transparent, but equally erroneous, makes it certain that this heresy is still fondly cherished by very many that have so far been totally unable to entirely forget the traditions of the past and rise to the level of a nineteenth century range of thought. The delusion arises from the oft repeated observation and perhaps experiment of performing work with a lever in the hands of an individual, that could not be performed by the direct application of muscular strength. Those, however, that base their calculations upon such performances or observations must not forget that in all such tests, time is totally ignored, while in all mechanical work time is a dominant factor that is not and cannot be ignored.

A single glance at a wheel of any description ought to convince the most thoughtless that there is no such factor as leverage in mechanics. A wheel is a simple lever with the fulcrum in the centre. Every man knows that if he takes a lever and places a fulcrum under the middle of it, making both arms the same length, that he can raise no more weight with it than he can by a direct application of his strength. It is balanced work equals strength and strength equals work as we may want to make the comparison. That is all there is to the "leverage" of a wheel, and all that can possibly be made of it.

"Oh," but says the leverage crank, "while it is true there is nothing gained in leverage by the use of a single wheel, much is gained by combining wheels, as in that way we can increase the length of the long arm of the lever at will, and decrease the length of the short arm in proportion. By so doing we obtain unlimited advantage by leverage." Yes, so perpetual motion idiots have always thought, and presumably always will think as they follow each other in the paths of darkness and destruction.

But to illustrate. Years ago, when the writer was an apprentice, the question of leverage in mechanics came up now and then. The question came up more frequently then than now, because we were less enlightened then for discussion. On one occasion we were engaged in the construction of a wooden overshot water wheel, around one of the rims of which we were putting an iron segment rim, with teeth to gear into a pinion for driving the machinery of the mill. I had been thinking the leverage question over in reference to that wheel, and finally evolved a problem with which I intended to overwhelm the boss. On the first proper occasion I put it at him something after this fashion: "Now, then, Mr. K., you say that there is no mechanical gains in leverage.

I want to ask you if, instead of putting a segment rim on the outside of the rim water wheel, which is about 18 feet in diameter, we would put a master wheel on the water wheel shaft 9 feet in diameter, if we could not gain two to one by leverage and exert double the force on the pinion?" "That is very true," he replied, "but in so doing we would reduce the speed of the machine, say just one-half." That reply knocked me out. I had revolved the question, as I had thought, from every point of view, but strangely enough, had not thought of that phase of it. It was natural enough and plain enough when my attention was called to it, and I saw plainly that instead of cornering the boss he had cornered me.

"But to further illustrate," he said, "we will assume that this is a 40-horse power water wheel, and we are going to use it for raising a weight of 33,000 pounds 40 feet high per minute. The raising of 33,000 pounds one foot high per minute, you know, equals one-horse power, as we are now constructing the wheel and arranging the machinery. But, as said, if we substitute a 9-foot master wheel for the segment rim we reduce the speed of the machinery just one-half, and can therefore lift the weight but 20 feet high per minute instead of 40, as now intended. To raise 33,000 pounds 20 feet high per minute requires but 20-horse power, which is but half the working strength of the wheel. We can therefore raise the weight 66,000 pounds 20 feet high per minute, which just equals 33,000 pounds 40 feet high per minute. So you see there is nothing gained in actual work by your supposed gain in leverage. It is a stand off. Nothing ever has and nothing ever will be gained in that way."

I was convinced, and from that time until now have never been guilty of advocating "leverage" as a factor in facilitating mechanical work. It can't do it, as the above sample lesson plainly illustrates. Foolish, indeed, is the man that clings to the fatal delusion, more especially if he attempts to utilize it, as many have done in wild perpetual motion schemes.

CONTRIVANCE FOR STOPPING AN ENGINE.

AN ingenious contrivance for stopping an engine in a machine shop occupies not more than a cubic foot of space, and consists of an electro-magnet, a system of small levers and a cylindrical chamber at right angles to the steam supply pipe, this chamber containing two connected valves—one thick and the other thin. When the steam is shut off the thicker valve lies across the main supply pipe; but when the steam is on, the two valves lie in the cylinder on either side of the upper pipe; when in this position the valves fit loosely enough into the cylinder to allow a strong pressure of steam on all sides of them. The motive power of the mechanism is furnished by two small electro-magnet spools, through which a current is sent by pressing the button in any part of the shop, this attracting to the magnets a small bar of steel which is fastened at one end of an angular lever; at the end of the lever's other arm, which runs horizontally, and on its under side, is a small notch, into which, when the machine is ready for action, fits the end of a vertical lever, to which is fastened a valve lever, hanging by the perpendicular, and so arranged that when it falls the two levers separate. The action of the magnet raises the end of the horizontal arm of the angular lever and loosens the smaller vertical lever, so that the weight of the valve swings it down in a semicircle, thus hitting a cam and tripping a valve. This exhausts the steam outside of the smaller valve in the cylinder, and the steam beyond the other drives it across the supply pipe with great force, shutting off the steam from the engine within fifteen or twenty seconds.

THE INVENTION OF THE MATCH.

HISTORY does not give to any one man the credit of inventing the match. That useful article reached its present state of perfection by a long series of inventions of various degrees of merit, the most important of which resulted from the progress of chemical science. Starting from the tinder-box and fyrstan of the Saxons, the first attempt to improve on the old sulphur match was made in 1805 by Chancel, a French chemist, who tipped cedar splints with a paste of chlorate of potash and sugar. On dipping one of these matches into a little bottle containing asbestos wetted with sulphuric acid, and withdrawing it, it burst into flame. This contrivance was introduced into England after the battle of Waterloo, and was sold at a high price, under the name of Prometheans. Some time after a man named Heurtner opened a shop in London. It was named the Lighthouse, and he added the inscription to the mural literature of London:

"To save your knuckles, time and trouble,
Use Huertner's Euperion."

An open box, containing fifty matches, and the sulphuric acid asbestos bottle were sold for a shilling. It had a large sale, and was known in the kitchen as the Hugh Perry. Heurtner brought out "vesuvians," consisting of a cartridge containing chlorate of potash and sugar and a glass bead full of sulphuric acid. On pressing the end with a pair of nippers, the bead was crushed and the paste burst into flame. This contrivance was afterward more fully and usefully employed for firing gunpowder in the railway fog-signal. The next was Walker. He was a druggist at Stockton-on-Tees, and in 1827 produced what is called "congreves," never making use of the word "Lucifer," which was not yet applied to matches. His splints of potash paste, in which gum was substituted for sugar, and there was added a small quantity of sulphide of antimony. The match was ignited by being drawn through a fold of sandpaper, with pressure; but it often happened that the tipped part was torn off without igniting, or, if ignited, it sometimes scattered balls of fire about. These matches were held to be so dangerous that they were prohibited by law in France and Germany. The first grand improvement in the manufacture took place in 1833, by the introduction of phosphorus into the paste, and this seems to have suggested the word "Lucifer," which the match has ever since retained. When phosphorus was first introduced to the match-makers, its price was \$21 per pound; but the demand for it soon became so great that it had to be manufactured by the ton, and the price quickly fell to \$1.25 per pound. Many inventors then entered the field, and matches were sent in shiploads to all parts of the world.

FLOUR MILLING IN BRAZIL.

THE London Miller says: "A brighter day seems to have dawned for the Rio de Janeiro Flour Mills and Granaries, Limited. The directors' report for the year ending August 31, 1893, shows a net profit of £10,065 2s. 9d., which, it appears, will suffice to pay a dividend of 7s. per share, and leave a balance of £1,315 2s. 9d. to carry forward to the new account. Such a result is the more satisfactory, seeing that the internal condition of Brazil has not been during the past twelve months exactly favorable to the operations of trade. It is not surprising to hear that since the date at which the accounts were made up, that is to say, the close of August last, 'the working of the mill has been greatly interfered with by the disturbed state of Rio de Janeiro,' but it is well to know that the mill and its belongings have hitherto taken no serious harm, and that the staff are reported safe and sound. Even war's alarms cannot extinguish man's craving for food."

VIEWS AND INTERVIEWS.

All The Year
Round.

Every one knows who knows anything about wheat, that it is harvested every month in the year. Australia, Argentine Republic and Chili harvest in January; India and upper Egypt harvest in February and March; lower Egypt, Syria, Cyprus, Persia, Asia Minor and Mexico in April; Algeria, Central Asia, China, Japan, Morocco and Texas in May; and Turkey, Italy, Spain, Greece, Portugal, south of France, California, Oregon, Louisiana, Mississippi, Alabama, Georgia, South Carolina, North Carolina, Tennessee, Kentucky, Arkansas, Kansas and Missouri in June.

Vitality
of Wheat.

From field experiments carried on the agricultural experiment station, Purdue, University, Indiana, extending over ten years, it appears none of the varieties of wheat tried have any tendency to deteriorate or "run out," providing proper care is exercised. No wheat proves to be "rust proof," but early wheats are generally less injured by rust than later kinds. Eight pecks of seed per acre gave the best results at the station, the average yield of nine years being 30.35 bushels per acre. The best results came from sowings made not later than Sept. 20th. The value of crop rotation in maintaining yields of grain has been strongly emphasized, for a comparison of rotating crops with constant grain cropping for seven years showed average gain of 3.7 bu. acre in favor of the former.

A General
Growl.

Everyone is growling. At least it so seems. The times are everywhere out of joint, and things, not alone at home, to borrow the words of Will Carlton, but everywhere else, are crossways and in a tangle. Applying the plaint to the flour trade, as the Roller Miller has said: "The miller declares that the grasping grocer is skimming the cream off the flour trade. The baker makes the same complaint about the bread trade. The farmers, ditto of the milk, butter, egg and poultry trade. If this thing goes on, the greedy and grasping grocer will be getting the cream off all creation. Then the song will be—

It is the grocer's daughter,
And she is grown so dear, so dear,
That I would be the jewel
That trembles in her ear.

The miller's daughter will simply not be in it."

Corn Fed
Hogs.

It is a matter worthy of note that the hog products that command the highest prices in the English markets come from countries that are not noted for the production of corn—England, Ireland and Denmark. The quality and consequence of the high price of England, Ireland and Danish bacon is due, first to the feeding of the hog, and second, to the manner of curing. The finest quality of bacon is produced by feeding barley, rye, wheat, peas and boiled potatoes, skim milk, butter milk and whey. The hogs should range in weight, from 180 to 220 lbs., and should be long and lean, with well developed hams, straight bellies, and the fat on the back should not exceed one and one-half inches in thickness. The shoulders, sides and hams are cured in one piece. The over fat corn fed hog does not make the finest bacon and does not bring the highest price. By paying attention to these requisites the Danish farmers have increased their sales of bacon in England from 4,000,000 lbs. in 1881 to about 200,000,000 lbs. in 1892, and the price has steadily increased.

Milling
Inventions.

Europeans are showing less or more activity in the invention of new milling machinery. Among late ones in England is a "separator for middlings and the like," in which, as the Milling World remarks, there is nothing startling or revolutionary, but which has some plain, practical points to commend it. From Liverpool comes word of the invention of a middlings purifier by J. Higginbottom. This invention relates to improvements in purifiers and is applicable to former machines built by the inventor. A third late invention patented in England

is a sifting machine, by G. Mærky, of Woschnau, Switzerland. According to the specifications in the patent, this invention relates to the construction of a sifting-machine in which a number of products may be simultaneously sifted into a number of different grades. The sieves are arranged in one or more boxes, supported by hangers from the frame of the machine and driven by eccentric-rods, from the main driving-shaft. The sieves in the boxes may be divided by partitions, so that an suitable number of different materials may be treated at once. The material follows the course and is delivered in different grades through the shoots. The material that falls through the shoot is delivered to the sieves in the lower box. If so many grades are not required, only one sieve-box may be employed, and the sieves may be arranged somewhat differently. A number of defecting plates may be attached to the sieves to forward the material over the surface of the sieves. The sieves are kept clean by means of brushes working beneath the sieve. The worm is driven by belt-gearing from the main-driving shaft. The worm rocks the vertical shaft by means of a worm-wheel, the connecting-rod and the arm attached to the shaft. Arms are pivoted on the shaft and driven by stops on a bracket secured on the shaft. The arms operate a block sliding on a fixed rod, and the actuating-rods for the brushes are attached to the block. The amount of play given to the arm corresponds to the stroke of the sieve while passing slowly over it, and thus prevents any damage being done to the sifting-surface. The Milling World remarks of these inventions: "These are not new lines, and it is a question whether they are lines that will promise good results. They serve to show in what particulars the inventors are looking for improvements. It would seem judging from the preponderance of sifting-machines among recent European inventions, that European millers are still finding their greatest trouble with purification and separation."

COST OF RUNNING UNDER SPEED.

SOME of the calculations which have been made upon the cost of stopping, even for a single minute, the motive power of a large mill are quite startling, says Power, and suggest the enormity of the loss which must be occasioned by running a mill under speed. The loss from an accidental shut-down may be momentary, and ceases when the engine is started up again. The loss from running under speed is continuous, and decreases the product of the mill more than would a shut-down of some length. Take, again, the mill with 2,000 operatives averaging ten cents per hour. If the product turned out by each operative is proportional to the speed of his machinery, and the engine runs 59½ instead of 60 revolutions per minute, the result would be equal to a loss of half a minute on each hour, or nearly \$17 for ten hours, again without counting the loss of profits, etc. Would it not be well to see that the engine is always on time, and that too much speed is not lost between the engine and machinery through slipping belts?

ELECTRIC CANALBOATS IN FRANCE.

ELECTRIC propulsion on canals, says Cassier's Magazine, is not altogether so new a thing as those who read of the Erie canal enterprise may have been led to think. For some time past, in fact, electric power has been applied to identically the same purpose in France, on the Canal du Bourgogne, and illustrations which have appeared in several French papers of the electrically equipped boats there used have shown the arrangement adopted to be similar in many respects to that only recently carried out in the United States. On the French boats, however, the electric motors are not coupled to the propeller shafts, but, instead, drive trains of gearing by which a chain on the bottom of the canal is clutched, thus pulling the boats along. Chain haulage of this general kind has long been in use on some of the European waterways, and, in itself, is nothing new, simply illustrating in this instance another example of electric development of an old method of propulsion. The double-trolley system is employed, and the current is furnished by generators driven by turbines, the canal company controlling near-by water powers which could be readily utilized.

INCREASING THE TEMPERATURE OF STEAM.

SOME short time ago, says the Scientific American, it was suggested by Lord Rayleigh that the efficiency of the steam engine might conceivably be increased by adding some salt to the water in the boiler, which should have the effect of raising the boiling point of the solution. The idea sought to be conveyed was that the initial temperature of the working fluid might be thereby increased, thus providing for a larger range and a greater fall of temperature between the boiler and the condenser.

Certain critics objected to this proposition that to raise the boiling point of an aqueous solution does not necessarily imply a corresponding elevation of the temperature of the evolved vapor, which is simply that of water, and must accordingly possess only the temperature corresponding to the pressure. A number of experiments to determine the temperature of the steam arising from a boiling salt solution have been made from time to time; but the results have been of a conflicting character. The difficulty of arriving at trustworthy results in this class of experiments consists in the circumstance that, while the walls of the steam chamber must be at a temperature higher than that of boiling water, and yet below the temperature of the solution, a sufficient quantity of steam must be evolved to insure that these walls shall not exercise any appreciable cooling effect upon it. These desiderata are claimed to be all satisfied by an arrangement devised by Professor Sokurai, of the College of Sciences of the Imperial Japanese University, by the aid of which it has been determined that the temperature of steam escaping from boiling aqueous solutions of such salts as calcium chloride, sodium nitrate, potassium nitrate, is exactly the same as the solution itself. This is a corroboration of Lord Rayleigh, but whether of any material service to mechanical engineers remains to be seen.

TRICK OF A SAFETY VALVE.

AN engineer recently observed his steam gauge indicating a higher pressure than his safety valve spring was set for. He slackened the spring, but the gauge kept rising and the steam did not blow off. He slackened the spring further, still the steam did not blow. When the pressure rose to 200 pounds he became alarmed; and as he could not start the engine he started the injector and opened the water blow-off cock. The damper being closed, this had the effect to prevent further increase of pressure. On examining the safety valve it appeared that the brass seat of the valve was a bushing put into an iron casting, that it had become loose and that the steam had pressed it up against the valve. As the valve rose the seat followed it, and there could not have been a release of steam until the bushing was pushed out of its hole. Some serious accidents have occurred from this cause. It is not good engineering to so construct safety valves that it is possible for the valve-seat to become detached.

TRADE NOTES.

The survival of the fittest applies more to the manufacturing and producing of satisfactory oils than to almost anything else we know of. A satisfactory oil is a thing to be prized. No one except an engineer, or one who has charge of lightning running machinery, can appreciate an oil that will do the work and keep the bearings cool, as against an oil that comes a little short, that can't quite do the work, costs a little less but takes double the quantity and keeps everybody nervous, fearing stoppages and delays caused by hot boxes, cut outs, etc. There is no further any uncertainty about oils. Long practice and experience have come to the aid of Samuel Rogers & Co., together with their ample means and facilities for manufacturing and selling oils of all grades, places them at the head of the list in this line. Their oils have undoubted merit. They are careful, painstaking, reliable people; their great aim being to produce the best quality possible in every grade, from the cheapest black oil, to the finest engine and cylinder oil. They have made a special study of the various grades required for all the various uses, and especially mill uses, and have produced heavy, strong oils that are prizes for heavy work. We can say to our friends that they can depend on the goods they buy from this company, they are solid. See their advt. in this issue of the MILLER.

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COOPERAGE D'P'T.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

TRADE REVIEW.

SINCE our last report the weather all over the cooperative district has remained open with the exception of a heavy snow storm which took place on the 12th inst. This snow storm did not help the mills to any great extent, as owing to the very high wind the snow did not remain on the roads and made sleighing impossible except through the woods. Very few indeed of the mills have yet got in one-third of a stock, some of them not having more than two weeks' run, whereas a year ago they had all the stock they could manufacture for a nine months run.

The flour barrel trade in the States is looking up considerable, and cooperage stock manufacturers in Canada have disposed of nearly all their surplus of dry stock which they carried over from last year. With very few exceptions flour mills in Canada have been running light and not using a very large quantity of cooperage stock. From the present outlook it would seem that stock is likely to be very scarce before the end of the present season, and should a good apple crop come on top of the short crop of logs, it will puzzle consumers of cooperage stock to supply their wants for next spring. The following are the present prices of cooperage stock f. o. b. cars, Toronto:

No. 1	30" jointed elm staves	Per net 1,000
		\$5 85
Mr. R.	30" " "	5 50
"	2 30" " "	3 85
"	1 24" " "	4 65
No. 1	5½ ft. patent coiled hoops	6 05
"	1 6½ ft. " "	6 65
		Per set
No. 1	17½" kiln dried heading	4½ c.
"	2 17½" " "	3¾ c.
12 in. head-liners, 40c per net 1,000.		

We may say that the largest manufacturers of cooperage stock in Ontario have placed large blocks of staves in the United States for delivery over this year. They are very likely to place almost their entire cut in the States this year owing to the demand for Canadian staves which bring the highest price and the likelihood of the duty being taken off staves by the Wilson bill if it should pass the Senate in its present form.

UNITED STATES MARKETS.

CHICAGO : There are few buyers of cooperage at any price, and tierces are dragging at 85 to 87½ cents. Receipts of hogs continue light, amounting to 6,500 Tuesday and 10,000 Wednesday. Pork barrels are held at 65 cents, and slow sale at that figure, many of the packing houses being shut down. Tierce staves are moving slowly at \$18 to \$19, and coopers generally are very slow in making payment for stock purchased, being unable to sell their cooperage. Pork staves are scarce, and a few cars suitable for pickle barrels might find sale at \$15 to \$16 a thousand. Short stock, 24 inches and under, is not wanted, and cars of even first quality would hardly sell for enough to pay the freight. Circle heading has arrived in excess of the demand, and lower prices have generally been accepted. Tierce heading is held at 13 to 13½ cents, and pork heading is unsaleable at 11 cents. Tierce hoops have declined in value, so that \$10 is a good price for the best. Hickory flour barrel hoops are freely offered, but there is no demand. The nominal price is not over \$4 a thousand.

MINNEAPOLIS: A good deal of interest is shown among local flour barrel manufacturers in the state of weather and roads in the hardwood country of lower Michigan and Canada. Last week for the first time this winter there was cold enough weather to permit of making roads fit for hauling logs to the stave factories. There is yet no snow, but there will be a general rush to haul on artificial roads, and it is hoped that by the close of the season there will be a fairly good supply on hand at the factories. But in spite of all activity there will be a shortage, and for this reason some of the stave men are

inclined to hold for better prices than have been ruling for a time. A contract for 4,000,000 staves has recently been made, and it is said that the price is something less than the old established price of \$6.75. It is noticeable that almost all stave men are willing to make long contracts for \$6.75, in spite of the poor logging conditions. Some think that the stave stocks held over from last year with the crop of this year will suffice for the coming year's demands. Heading is still weak in spite of the meeting of heading manufacturers last week. Just before the meeting there were offers of No 1 heading made freely for 3½ cents. The association put the price at 4½ cents, but the local shops are not yet paying that price, though as yet no buying has been done since the meeting. Little faith is here put in the ability of the heading men to keep the price up to that point. The most of the contracts now in force are to run from four months to a year and are made at 4 to 4¼ cents. The barrel makers think that by the end of the year the association will have lost what grip it may have, but this remains yet to be proven. Hickory hoops are plenty and weak. Good hoops and plenty of them can be had at \$7 though \$7.25 is the contract price for the greater part of those now being used. Elm hoops do not vary from \$7 to \$7.25 though not particularly stiff at \$7.25. Oak staves are coming at 12 cents. The proportion of oak to elm used here is about as one to twelve.

BUFFALO: A correspondent of the Northwestern Miller says: "There is very little stock moving. Jobbers and coopers report even a more complete stoppage of milling operations lately than is admitted by millers direct. Stock is very low, and supplies are cut off by the absence of snow in the Canadian woods. Everything has had to be carted to the factories. Northern Michigan has done somewhat better, but the supply is nowhere large. There has been an effort to cut down the price of making flour barrels here to 9c. consequent on a demand for barrels to the trade at 32c. In both cases the reduction appears to have been conceded."

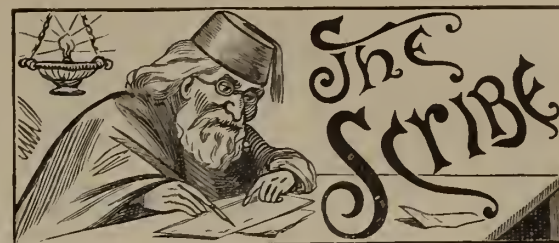
COOPERS' CHIPS.

The heading men of Wisconsin and Minnesota, representing sixteen factories, met at Eau Claire on 9th inst., and formed an association to continue for two years.

The mills of St. Louis are sacking heavily, and using only about 7,500 flour barrels weekly. The demand for stock is light. Shaved hoops can be bought now for the lowest price ever known. There is a pretty good call for potato barrels, though prices are very low.

Mr. J. Innes, of Sutherland, Innes & Co., of Chatham, Ont., when in Minneapolis a week ago, arranged with W. B. Judd, an experienced stock man, to act as north-western representative of the firm. Mr. Judd formerly operated a heading factory at Barron, Wis., and has a large acquaintance with the trade. Sutherland, Innes & Co. are understood to have recently contracted with the Hardwood Mfg. Co. for 4,000,000 staves, for future delivery—half here and half at Duluth.

The Michigan correspondent of the CANADA LUMBERMAN says : " The manufacture of elm hoops for sugar, pork and flour barrels has grown into a large industry in some parts of Michigan. There are five hoop mills on the Saginaw river, the cut of which in 1893 amounted to 75,000,000. H. Seeley operates a hoop mill at Beaverton, and the Michigan Lining & Hoop Company, of Coleman. A new stave and hoop mill is being built by Hecox & Co., at Coleman ; and Geo. Fiege, of Saginaw, operates a mill at Gaylord. There are also a few others in northern Michigan. Elm logs last winter brought \$6 to \$8 and are about \$1 a thousand less this season. Large quantities of elm logs are also consumed in the manufacture of staves. The stock of hoops cut last season was pretty well sold up. There is a large quantity of elm timber in this section of the state. A few years ago it was considered of little value, but the development of the hoop and stave industry has put a good value on this timber. The Hecox Company, of Toledo, recently paid \$10,000 for the timber on 2,500 acres of land near Coleman. The stave men just now are concerned over the Wilson bill not feeling sure how it is going to strike them."



MAYOR MCCAULEY, of Edmonton, told a good story at a dinner lately. The old-timers had been reminiscent, and one of them had described the first flour mill taken into Edmonton. The affair was a small hand machine, which, when flour was \$25 a bag, proved a profitable investment. The mayor declared that he had endeavoured to purchase a similar mill, and in reply to his enquiries in the east, had received a letter to the effect that the only record of such a mill that could be learned of was in the 14th chapter of Matthew, and the 15th verse, where it was recorded of two women who were working at a mill that one was taken and the other left. It was hinted that the owner must have met the man that was left, and so secured the mill, which was the only one of its kind in existence.

* * * *

It may not be easy work to gather sunbeams from cucumbers, and with trade depressed, as it has been for some time, and market conditions, so far at least as grain and flour are concerned, becoming worse, as the days roll by, there will seem to be little comfort in talking of the better days to come. Yet these better days will come, even though the hope of them may not count as currency in keeping the mill running and making money just now. This is about the mood in which I found ex-president McLaughlin, of the Dominion Millers' Association, as I chatted with him the other day of business in general and milling business in particular. Mr. McLaughlin is no pessimist at any time. He was quite ready to admit that milling for the past year had been very dull. Few of the millers of the country, he said, are running more than about half-capacity. This is the case in the city, and the same story is told by outside millers, wherever one might meet them. But this kind of thing is not going to continue for ever. Just now everyone is buying simply from hand to mouth, not desiring to incur any unnecessary outlay. This method, however, works only one way. The stocks throughout the country are everywhere down to the smallest point. As has been remarked, dealers are carrying no surplus stocks; any reserves the mills may have had are being drawn upon to fill orders, so that the day is perhaps not so far away when there will be little or no flour on hand with miller or dealer. Then times will have revived, and, take this as sound gospel, added this well-known representative of the milling trades, our mills will be taxed to their fullest to meet the calls upon them. Methinks this is sound reasoning of my friend McLaughlin. History has repeated itself in this manner over and over again. At the same time, canny and careful, and yet one of the shrewdest of business men, as Mr. McLaughlin is known to be, he would be the last man to make a suggestion that would lead, or give encouragement, to any line of extravagance. A lesson of the present crisis, said he, is for business men to stick closely to their own business. It is no time to venture into outside speculations, and the man who does so stands a good chance to land himself on the rocks. It is a time, too, when business men need to be careful of the out-go. Expenses must be kept down, and every detail of business closely watched. In this manner Mr. McLaughlin chatted pleasantly on, and methinks his philosophy was sound. Sensible to things as they exist, and yet not cast down. I was tempted, of course, to ask the ex-president for his opinion of the present low prices of wheat, which have become lower than ever during the month, and what this constant dropping meant. Prices will be better was the reply. They will not, however, get up to the old level of former days. This is not to be expected, for the cost of production in all lines, farming not excepted, is lower to-day than of old.



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J. S. ROBERTSON, - - - EDITOR.

THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

A WORD WITH SUBSCRIBERS.

THE current CANADIAN MILLER goes to a large number of subscribers with bill enclosed for subscriptions that fell due at the new year. The amount in most cases is not more than one dollar, and, even where arrears are owing, the indebtedness to the individual is only trifling. But 2,000 such accounts mean anything from \$2,000 to \$3,000 to the publisher, and money is much needed by him at the present time. It costs a heavy outlay each month to produce a journal of the completeness and character of the MILLER. Subscribers, we have reason to believe, appreciate these efforts to give them a first-class trade journal. Our desire is to make further improvements during 1894. Saying this much, we rely upon subscribers responding favorably to the present request to remit promptly the amounts now due.

GERMINATING POWER OF CANADIAN GRAIN.

BULLETIN No. 1, of experimental farm notes, which has been issued by Mr. Wm. Saunders, director of experimental farms, Ottawa, deals with the germinating power of grain grown in Canada during the season of 1893.

The testing of the germinating power and vigour of samples of grain grown in the several provinces of the Dominion during 1893 began on the 9th of December, 1893, and since that date 1,153 samples have been placed under test. The testing is conducted in duplicate; in one case the grain is planted in the soil, in the other in a suitable apparatus between folds of linen kept constantly moist. With 686 samples the tests are now completed, and while thus far the average vitality stands higher than in the crop of 1892, which is very gratifying, there is, nevertheless, a serious drawback in connection with the samples of barley which have been received from Manitoba, the Northwest Territories, New Brunswick and Quebec in the unusually large proportion of plants of weak growth. The percentage is small in the samples from Prince Edward Island, Nova Scotia, Ontario and British Columbia.

The results of these experiments are considered to be very encouraging to wheat growing in Canada, Mr. Saunders remarking that "It is doubtful if any other country in the world could show so high an average as 91.9 per cent. in 686 tests of samples received indiscriminately from all parts of its territory, especially since many of these were sent because they were suspected of being deficient in germinating power."

The provinces and territories at present stand thus in order of merit:

	No. of Samples Tested.	Average Vitality.
British Columbia.....	21	97.4
Northwest Territories.....	18	96.3
Ontario.....	145	94.5
Manitoba.....	35	92.7
New Brunswick.....	115	92.
Prince Edward Island.....	37	90.8
Quebec.....	225	90.6
Nova Scotia.....	91	89.1

The fact that in this series of tests samples of wheat have gone as low as 28 per cent., barley 47 per cent., and oats 50 per cent., should be sufficient, Mr.

Saunders believes, to induce those farmers who are holding seed of doubtful vitality for spring sowing, to send samples at once to the Central Experimental Farm so that they may be tested and reported on before the time for seeding arrives. These samples are tested free of charge, and the reports of the results can usually be sent within two weeks from the date of receipt of the samples. About one ounce of the grain is sufficient for the test, and the samples can be sent from any part of the Dominion to the Central Experimental Farm through the mail free.

The MILLER has frequently pointed out the intimate relationship that exists between the vocation of the farmer, as the sower of grain, and the miller who grinds it into flour, and we simply state the fact here, again, without further observation, to show the importance of millers doing what they can to influence farmers to grow only the better grain.

EDITORIAL NOTES.

THE French government is moving in the direction of certain changes in the bonding of wheat. A dispatch from Paris of a week ago says: "At a Cabinet Council held at the Palace of Elysee to-day, it was decided that the Government should introduce into the Chamber of Deputies a Bill limiting to one year the period for which wheat may be bonded. It was also decided providing the enforcement of the new duties on wheat, to impose a sur-tax of 10 per cent. on wheat from countries other than those of Europe. Imported flour may be bonded and when it is taken out of bond will have to pay, in addition to the wheat duty, interest thereon from the time from which it is imported."

AT a season when distress in all parts of the country is more severe than it has been for years, our own prosperous Dominion not escaping the depression, we are each one disposed to view our own case as the most severe. But there are degrees of privation we know nothing of in this land. The philanthropically disposed are distributing bread to the poor, and their hearts are being made glad thereby, but it is good bread, sweet bread, they are receiving. In South Russia, because of the high price fuel, the peasants bake bread once in three or four months. Towards the end of the second month the bread becomes like stones, and were it not the Russian peasants' stomachs would seem to be made of cast iron, circumstances probably constituting them so, they would never be able to digest the food.

WITH the price of wheat for some time past down to about a cent a pound, Ontario farmers are seriously considering what can best be done to meet these altered conditions. Some have suggested that a change be made from wheat growing to the raising of cattle. Others advocate chopping the wheat and selling it for feed, as more profitable than seeking purchasers at present market prices. A suggestion is made in another quarter to grow grain for seed for export as a method of realizing a good profit. This season, we are told, Canada fancy alsike brought as much as 20c. more per 112 pounds in the English, French and German markets than was paid for the best American seed, and two years ago the first Canada alsike sold 30s. higher than any other importations offered. The case is mentioned of a farmer, who got 75 per cent. more out of his 32 acres than he would have received if he raised wheat.

IN Minnesota, Illinois, and Dakota, and possibly in other points, it is claimed that experiments have been made, demonstrating very clearly what is suggested in a paragraph we have given place to elsewhere, that the most profitable purpose to which wheat can be put at present low prices is to feed it to the hogs. A good many hogs, we are told by the St. Paul Pioneer Press, have recently come into the St. Paul market fattened on wheat, and the result has been that the farmer has got more than twice as much for his wheat in this form as he could have realized for it by selling the grain itself. When hogs are only 4½ cents a pound the farmer can get at least \$1 bushel for his wheat converted into pork,

and by this plan he can also escape a very large share of the charge for transporting his wheat to market. In a recent instance a North Dakota farmer got nearly \$1,400 for a carload of wheat-fed hogs at the South St. Paul Stock Yards, when he couldn't have realized more than \$150 at Minneapolis for a carload of wheat.

THE early fixing of the rate of tolls on the St. Lawrence canals for the season will enable those in the grain trade to make contracts ahead for the sale and transportation of grain on the opening of navigation. Referring to this matter the Witness, Montreal, says: The Dominion government has responded promptly to the demand of the Board of Trade and corn exchange for the abolition of canal tolls on eastward through grain. The government has not abolished the tolls, but has fixed them at the same rate as last year, namely, ten cents per ton on all grain passing through the Welland Canal, payment at that canal ensuring free passage through the St. Lawrence river canals. Thus, American grain shipped via Oswego, Rochester, Ogdensburg or any American port east of the Welland canal to an American destination pays the same as grain destined for Montreal, and passing through all the St. Lawrence canals. Wheat transhipped at Ogdensburg for Montreal is no longer charged extra tolls owing to the retaliatory tolls imposed by the American government upon Canadian vessels passing through the Sault Ste. Marie canal in 1892.

MEMBERS of the Montreal Board of Trade are agitating for the establishment of a wheat pit on 'Change similar to that in Chicago. This step was proposed some months ago, but better judgment seemed to have prevailed, and the matter was allowed to drop. A question of the legality of the move was also raised. We do not know that any more is known on this point now than then, but Montrealers who are anxious for the change ask if the pit is legal in Chicago, why not in Montreal? There might be many reasons why: One that Montreal is in Canada, and Chicago is in the United States. A further argument is, that dealers want to be able to trade at home on the same basis as in Chicago, where they would take delivery of the wheat or whatever article would be traded in. Should the pit be established, advocates point out that all the money that goes to Chicago would at least remain in Montreal. A leading grain broker said that he knew certain Montrealers who bought wheat in Chicago two years ago, changed it from time to time and sold it recently at a loss of eighty cents a bushel, caused by depreciation and carrying charges. This, he says, should be one of the best arguments in favor of a local wheat pit.

THE Milling World, of Buffalo, does not like our reprinting in last month's MILLER, an article from the Commercial, also of the Bison city, speaking of the superiority of Canadian barley over the American cereal. The Commercial made the statement that "Canadian barley fetches in the American market 10 to 15 cents a bushel more than its American rival." This statement the Milling World wants to call into question and produces certain figures to verify its statement. We leave the two journals to fight out this matter of quotations themselves. When, however, our milling cotemporary wants to tell its readers that the American grown article is just as favorably received by the malsters of his country, as the Canadian barley, the bluff is too funny, coming even from the Milling World. What about the recent dispatch from Washington saying that Secretary of Agriculture Morton has promulgated an order for the purchase of many thousands bushels of Canadian barley for seed with which to furnish the farmers of the United States? The object, it is plainly stated, is to endeavor to raise the superior quality of barley now grown in Canada, admitting at once an important distinction. We are ready to agree with the Milling World that the beer made from the American barley "will craze, besot, imbrute, degrade, and destroy the drinkers just as rapidly now, as it ever did when it had Canadian products in its composition." Nevertheless this is rather away from the question at issue.

INDIA'S WHEAT TRADE.

NOW that the rupee of British India is a recognized factor in the monetary conditions of the commercial world, it is interesting to note, writes Thomas Patrick Hughes, "that India ranks third among the countries of the world as a wheat-producing country, with every prospect of taking a second if not a first place both as to production and export. The United States exports some eight-three millions of bushels out of its annual yield of four hundred and forty, and Russia is able to spare about the same quantity out of its production of two hundred and forty millions of bushels. And although France stands second on the list, as a producer of three hundred and ten millions of bushels, she is the importer of thirty-eight millions of bushels, and the rapidly increasing population of the United States would indicate a gradually increasing demand for home consumption. In the meantime the growth of wheat in India is rapidly increasing, and the yearly exports of wheat from the ports of Kurrachee and Bombay show a marvellous development of the country as a wheat-contributor to the markets of Europe. During the last year the estimated growth of wheat in India was two hundred and three millions of bushels, or about one bushel to each unit of the population of that vast empire. Out of this quantity thirty millions of bushels were exported, being about one-eighth of her production, as compared with one-fifth of America, and the one-third of Russia. This year the yield is estimated at two hundred and sixty-seven million bushels. But while the export of wheat from the United States may be expected to dwindle, as her population and industrial development progresses, the surplus of wheat in India must be an increasing quantity.

Owing to a magnificent system of irrigation carried on throughout the Indian empire, under the control of skilled experts in the science of irrigation employed by the government, the growth of wheat in those sunburnt regions no longer depends upon the rainfall. In those fertile districts where the government irrigation works have been constructed the farmer gets his spring and autumn harvests without waiting for the 'former and latter rain.' This is especially the case with the valley of the Punjab, which only thirty years ago was dry and arid, but now blossoms as the rose under the fertilizing influences of those great works of irrigation so efficiently worked and controlled by the government irrigation department. The opening of a railway to Cashmere brings another almost unknown wheat-producing country into the market. And the recent annexation of Burmah another. In fact, British India is still undeveloped. It is a country in which you can never say of any enterprise, it is finished. The Indian zamindar, or landowner, is as ignorant of the possibilities of his country as a settler in the Wild West. He has not yet awakened to the fact that there is a wheat market beyond the limits of his own land. The native farmer never reads a newspaper, and is a man destitute of ambition in commercial life. It was only a few years ago that he had to protect his lands against the inroads of the enemy, and he can scarcely realize that a reign of peace and commercial prosperity has begun. There is, in fact, no organized system of commercial development beyond the paternal rule of 'the barra sahib,' or the 'great gentleman,' as the district magistrate is called. This officer, to use the native expression, is literally the 'mabap' or 'mother and father' of the Indian farmer. But such a form of rule is not conducive to the development of private enterprise, and it might safely be said that whatever India has done in the way of increasing its export of wheat, it has been the result of a happy 'kismet' rather than of any organized system of trade. What it needed is increased capital and increased energy. A few millions of British capital and an importation of American enterprise would make Kurrachee a very important metropolis, and the Chicago of Asia. The great obstacle to the expansion of the Indian wheat trade is the less remunerative price which it commands in the market owing to its dirty condition. The Indian farmer garners his wheat under the enlightened rule of the Queen-Empress very much as he did in the warlike days of Barber. He threshes his wheat on the dry sod in front of the village host just as Gideon did in the time of the Judges, and this wheat is stored in

earthen barns which are pulled to pieces when the native agent from Kurrachee of Bombay pays the village his annual visit. It is therefore not surprising that hundreds of tons of 'pure dirt' are shipped to Europe at the exporter's expense, and that the London and Liverpool brokers still depreciate the wheat produce of British India. But all this will be changed in the course of a few years, and ere long India, the land of the silver rupee, must rank second, if not first, among the wheat-producing countries of the world."

CONSUMPTION OF POWER IN ROLLER MILLS.

BUT little positive information, says Mr. A. E. Baxter in the Northwestern Miller, exists at the present time regarding the consumption of power required by roller mills in the manufacture of flour. A well-equipped modern mill will require from one-half to thirty-six one-hundredths of a horse power per barrel of flour manufactured, according to capacity, and repeated indicator tests clearly demonstrate that in mills of seventy-five barrels capacity and under, at least .05 horse power barrel will be consumed, in mills of one hundred to two hundred barrels capacity at least .04 horse power per barrel, and in plants from eight hundred to three thousand barrels at least .36 horse power. Any plant producing a barrel of flour within these figures must be well equipped and properly handled, with an easy line of machines to operate, shafting well lined, bearings well lubricated and of sufficient number and length to prevent over-loading or heating, and no useless machines used in the operation. The elevator lines must be of ample strength to prevent deflection. This is one of the greatest evils in mill construction to-day. Fully sixty per cent of the power consumed will be absorbed on the roller floor and the lines of shafting connected thereto, twenty-five per cent is consumed in the bolting machinery and attachments, eight per cent by the process of purification, and seven per cent by elevator lines. This is for large mills, with cleaners driven by separate power. The break rolls will consume about ten per cent less power than the smooth rolls, the first and fifth breaks will consume less power than the second, third and fourth, and the second, will consume less power than the third or fourth. Another almost universal misconception exists regarding power consumed by modern dressers and centrifugal reels, all manufacturers claiming a saving of power over the old-style reels. This is a great mistake, as the indicator clearly shows that the mills built with these modern machines consume fully as much power per barrel as was consumed prior to displacement of the old reels. The saving of the room, however, is clearly in favor of the new machines. Another almost universal mistake is that a short system decreases the consumption of power. Repeated tests clearly demonstrate that the fact is just the reverse, and that a mill with a moderately long system will produce given results in quality of goods and clean-up at a saving of power over a short system giving equal results in quality and quantity. Tests indicate that an overloaded roll consumes a percentage of power not in direct proportion to the quantity of work performed. It is also clearly demonstrated that, after a certain speed of roll is attained, anything in excess of this speed is direct consumption of power without direct gain in capacity or quality of work produced. Dull corrugations will consume from twenty-five to fifty per cent. more power than when sharp, producing the same quantity of work.

CANADA'S NEW EXPORT GRAIN PORT.

THE fixing of St. John, N.B., as a grain and shipping port, to which reference has already been made in the MILLER, is described with some detail, and in complimentary terms, by Bradstreet's. This journal says: "St. John, N.B., has bounded into existence as a grain shipping port, and will hereafter be included among the North American cereal exporting points covered by wire by Bradstreet's each week in reporting totals of wheat, corn and flour sent abroad from the United States and the Dominion of Canada, both coasts. The Canadian Pacific Railway Company seems to be responsible for this added glory of the New Brunswick capital. Hitherto the winter grain export business of Canada has been done largely from New York, Boston and Port-

land. Recently the Canadian Pacific acquired the short line between Montreal and St. John, with a view, as now appears, to use St. John as a winter port. To further the plan the city gave a bonus of \$40,000 for the erection of an elevator, which has just been completed. The first consignment from St. John has been made, 16,000 bushels of wheat, and is the commencement of a trade 'which is expected to expand enormously.' The new elevator has a frontage of 400 feet and a depth of 27 feet and upward at low water, spring tides, and the wharf is therefore capable of accommodating 'one steanship of the largest size or two smaller vessels.' The elevator on the wharf is of modern construction, and has been pronounced by good judges 'the best elevator in Canada,' having a storage capacity of 360,000 bushels, and machinery sufficient if its storage capacity should be doubled. It will load an ordinary freight steamship in from four to six hours, and it is estimated 'that 4,000,000 bushels of grain can be shipped there monthly, provided there is not too much detention on the railway.'

HEATING IRON IN COLD WATER.

IT would now seem as though the common, but time-honored blacksmith's forge, and all other kinds of fiery furnaces, will become extinct and live only in the memory of a rapidly-receding past. The forge and furnace of the future will consist of a lead-lined glass or porcelain vase or cupola filled with cold acidified water, to which is connected a strong positive conductor. A pair of tongs with insulated handles attached to a flexible negative conductor are also provided, making the new forge and outfit complete.

The smith seizes the piece of iron he wishes to manipulate with the insulated tongs and plunges it into the sour water, which begins to boil and bubble the instant it comes in contact with the iron, which, in a remarkable short space of time, turns to a red and then to a white heat, ready for the work of the smith.

So rapidly is the heating done, that the water and the portion of the iron not immersed in the water is but slightly warmed.

The principle involved in this process is the same as in incandescent electric light. Resistance produces the light and heat. It is said that enormous heat can be produced by the method, much greater than is necessary to extract the iron from the most refractory ores.

Like all, or nearly all, of the late practical applications of electricity, this discovery will no doubt lead to marvelous results in the perfect and rapid handling of heavy iron and steel plates and bars that have to be hammered and welded, and more valuable still for tempering purposes, as the required heat for the immersed portion can be quickly obtained, while the remaining portion is kept comparatively cool, which cannot be done by present methods. By electricity we live and move, and by electricity some of us die.—Mechanical News.

NEW WHEAT FIELDS IN AFRICA.

IT may be recollected by some that about a year or two ago mention was made in these columns of the arrival in this country of samples of wheat and barley from Uganda, says the Liverpool Corn Trade News. We now give an extract from the Manchester Guardian of January 12th, bearing upon the same subject:

"I hear that samples of both wheat and barley grown on the Kikuyu plateau in British East Africa have reached the country, and that in Mark Lane the very highest opinion is expressed of the quality of both samples. This is especially the case with reference to the barley, which I am told has been declared to be as fine a sample as has ever been shown in the market. The Kikuyu plateau is on an average from 5,000 feet to 7,000 feet above sea level, and is one of the regions which Captain Lugard refers to as a probable field for European occupation, although situated within the tropics. As compared with Nyassaland it has several advantages as a grain producing region, not the least of which is that while the part of the Lake Nyassa region most readily available for cultivation—the Shire highlands—is a succession of hills and valleys, on the Kikuyu plateau there is a stretch of country 400 miles long which is nowhere below 5,000 feet above sea level. Of course nothing can be done to develop this grain-growing region until cheaper modes of transport are introduced, and I believe that the advocates of a railway from Mombassa to the Victoria Nyanza are especially pleased at the result of the experiment of growing wheat and barley in a district through which the projected line would pass."

Advertise in CANADIAN MILLER. It pays.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

WHERE THE BLAME IS.

THE amount of the "cheap and nasty" that is to be found in almost every department of manufactured product to-day is one of the unfortunate aspects of business methods of the day. Cotton is no longer cotton, and a yard wide. Broadcloth is shoddy, and patent flour may be ground from the poorest grade of wheat that the market has seen, and by millers who can lay no claim to being first-class workmen. Things, in very truth, are no longer what they seem.

It is flour, however, that claims our interest. The MILLER has given enough space of late to comments on the flour product that reaches England from this side of the Atlantic to show that British flour handlers are a good deal concerned over the deterioration, as they claim, of much of the flour that comes to them from America. Well, there seems to be very little doubt but that they are securing a good share of the "cheap and nasty" in flour, just as merchants in other branches of trade in this land are receiving lines of goods that possess more of the spurious in their composition than the good. But who is to blame? It is perfectly true that large quantities of low grade flour are manufactured, and much of this is exported to the United Kingdom. The very finest grades of flour, none better in the world, are also manufactured on this side of the water, and it can be exported also, if wanted. It is, however, as the Northwestern Miller has said, "the English miller cannot afford to pay the price. There will be no trouble about Liverpool or any other market getting the kind of flour it wants if it will pay what it is worth or what it will bring elsewhere. We confess that the temptation to smile has been very great on occasions when we have heard foreign buyers speak seriously of the sale of certain "well-known brands," as they called them, brands which sold largely in foreign markets which seemed to fully meet the wants of the trade there, and yet came from mills which were the veriest rat-traps, in charge of millers who were incompetent to hold positions as roustabouts in any first-class American mill, and which were never known to turn out a really excellent sack of flour, or one made with even the rudimentary economies of manufacture known to progressive millers. A large number of such mills are in operation to-day, and practically all their output goes abroad. Their owners would not venture to offer their flour in the high-class markets, and yet they set the pace for the foreign trade, and they do so because they are always low sellers and always in the market at bottom prices. Such connections as these are eagerly sought by English factors. Quality does not figure with them. They are the great makers of "masquerading" flour, and, because they sell in such quantities and at such low figures, they become the competition which meets the maker of better and more honest flour, when he puts his product before the British buyers, hoping that its quality will command at least some consideration at his hands. It is little wonder, therefore, if, in an attempt to hold business against such competition, the trend of the whole American trade has been toward a lowering of grades. The blame must be placed on a market which demands something for nothing, and the remedy must come when flour sells in England more on its actual merits and less on its stenciling."

If we commence to probe the problem a little further, it may be true, that the flour-handler demands a cheap flour of the miller, because the great consuming public have reached a point where they are constantly looking for something cheaper than the cheapest, and he must supply it, or the other fellow will capture his trade. The trend is, if this view be correct, downwards, and as Lord Beaconsfield has said, let the tastes of man or woman run in this direction, and he will soon grovel. The miller who will set the pitch in a higher key, and get the trade looking forward, will have performed a useful mission for all concerned.

BUDAPEST MILLS IN 1893.

A good deal has been written in American milling journals during the past year of the effects of competition from this side of the Atlantic on flour milling in Budapest, but from particulars furnished by the Miller, of London, Eng., it would not appear that the size of the output has been affected. If a large output could be accepted as the sole end of flour milling, says our British cotemporary, 1893, would be reckoned as the most successful that the mills of Budapest have known. For in the face of an ever growing provincial competition, the mills of the Hungarian capital not only maintained, but actually increased, their production, reaching the enormous figures of 7,000,000 metercentners (the m. is 220.46 lbs.). It is interesting to compare with this result the average yearly production from 1870 to 1889:—

	Metercentners.
The average yearly production of 1870-1874..	2,550,000
" " " 1875-1879..	3,054,565
" " " 1880-1884..	4,636,956
" " " 1885-1889..	5,510,000

On the other hand, it is alleged that few years have proved so destitute of profit in proportion to the work performed. For this unsatisfactory result a peculiar conjunction of adverse conditions, at home and abroad, seems to be responsible—an inflated and excited home wheat market synchronised with a period of great and perhaps unparalleled depression in the wheat and flour markets of the rest of the world. Under such circumstances, the export trade (which seems to have an irresistible fascination for Hungarian merchant millers) could only be carried on at a sacrifice. That the volume of trade with Great Britain and Brazil was well maintained was doubtless due to the Minister of Commerce, who caused the railway rates on all flour forwarded to the Port of Fiume to be reduced to a very low figure; that a similar concession has not been granted by the "Adria" line of steamers, which uses the port and enjoys a subvention from the Hungarian Government, has caused some surprise. With respect to Great Britain, our imports last year of Austro-Hungarian flour (of which the bulk is doubtless derived from Budapest) are returned by the Board of Trade at 1,099,614 cwts., against 977,272 cwts. in 1892, and 1,217,933 cwts. in 1891. The result in Brazil is creditable to the energy and perseverance of the Budapest millers, as in that country Austro-Hungarian flour has to fight a heavy duty imposed in favor of the millers of the United States. For the rest, Hungarian flour is being hardly treated in more than one foreign market. France seems disposed to adopt an absolutely prohibitive duty, while Spain adopts much the same attitude, but perhaps the unkindest cut has come from Austro-Hungary's neighbor and political ally, Germany. It is asserted that in spite of the reduction of duty granted to flour products from the Dual Empire by the Austro-German Commercial Treaty of 1892, the old and full duty of 10½ marks is still exacted on some pretext or another at many German custom houses. There appears to be the less excuse for so high-handed a measure, when it is considered that the reduced duty still amounts to 7.30 marks, which is more than double the duty on wheat. In the other half of the realm, that is to say, in Austria, the invasion of Hungarian flour is bitterly resented, and pressure has been placed on the Government to impose a 25 per cent. differential railway rate on flour, as it is believed that such a measure would attract Hungarian wheat and shut out Hungarian flour. A few of the Budapest mills holding large stocks of cheaply bought wheat profited by the sharp rise which set in towards the middle of the year, but died away by the advent of

autumn. The difference between the highest and lowest price of wheat during this crisis represented 27 per cent. It is not, therefore, surprising that the Budapest wheat market fluctuations of 1893 brought more loss than gain to the great merchant mills of that city. The fact that, in spite of all, many mills should be able to pay good dividends, speak highly for their management.

MEANINGLESS BRANDS OF FLOUR.

In another column we have something to say about the alleged deterioration of flour exported to the United Kingdom. A recent issue of the Pittsburg Commercial Gazette contains an article said to have been prepared by one of the best informed local authorities on the subject, in which the deception practised by many millers in the branding of their flour is handled in vigorous fashion. The article says: "The competition is so great and the margins have been cut down so low that mills have been making low prices and then making a flour to suit the price sold at, until half of the so-called 'fancy patent flour' sold in our markets to-day is nothing more than a second patent or a straight. It is high time the consumers of flour should realize the fact that they are being imposed upon every day. It is only the small mills which indulge in making a skimmed flour, but the same thing is practiced by quite a number of the mills of the extreme north-west. While they claim a superior quality of wheat, and their flour will take more water and has more gluten in it and will make more bread, yet they will persist in making a skimmed flour and try to pass it off to the trade as a first or best patent. The time was when 50 per cent. was supposed to be all the patent flour there was in No. 1 spring wheat, but to-day there is 90 and 95 per cent., and if they keep on with their latest improved machinery they will come to the conclusion they can work in the most of the feed and it will pass for fancy patent flour. Now mills that keep it up and think they can impose on the consumers of flour will find in the end something as bad as the Wilson bill has struck them, and they will find the wheels of their mills standing still. There are still a few Minneapolis mills that can be relied upon for a strictly fancy patent flour if the trade is willing to pay a fair price for it."

Commenting on these conditions, the Northwestern Miller says: "Such sentiments as the above are unfortunately not confined to any one market, and the substance of the whole matter is that the mere words "patent," "straight" and "bakers" no longer mean anything, unless they are coupled with the name of a mill of known reliability, which will not, for any mere temporary gain or advantage, suffer its brands to cover flour which is below the standard it ought to be. This, however, does not acquit the millers of our country from having done (anonymously, it is true), a grievous wrong to the general public, which in the long run, will react on the trade at large. So prevalent is the practice, that we fear it will become educated up to the point of seeing the absolute error of branding their sacks to suit their customers' wishes, utterly regardless of the character of the contents thereof. It seems to be regarded as perfectly good business morals to stencil sacks and barrels according to the buyers' desires and fancies, so long as the name of the real maker does not appear, and so long as the buyer makes it an absolute condition of sale that the flour shall bear his stencil and not the regular mill brand."

This, it must be admitted, is a sorry state of affairs, and is a case where we should hope Canadian millers can be held guiltless.

IN 1892 the United Kingdom imported 87 million cwt. of wheat and flour, and in 1893 nearly 86 million cwt.; but while in 1892 the value was £37,000,000, in 1893 it was only £31,000,000, showing the great decline in prices in those two articles.

WINTER crops, in Russia, are reported still in a satisfactory state (though not as brilliant as a month ago), as they also are in the Baltic provinces, central Russia and Poland (only rape seed looking badly, in Podolia and Kieff, where, however, field mice are doing mischief).



Office of the CANADIAN MILLER, }
February 20, 1894. }

THE GENERAL SURVEY.

THE wheat market has been one series of surprises for many months. But perhaps the greatest surprise was a further drop in prices a few weeks ago when the argument was, though there had been a continued series of drops, that it could not be possible for a still lower point to be reached. It came, however. And in this connection it is interesting to remark that simultaneous with the fall of the price of wheat came a fall in the price of silver. Prior to 1873, the price of silver had been approximately \$1.30 an ounce since the beginning of the century. Last June the price of the metal was in the neighborhood of eighty-three cents an ounce, when India, following the example of western nations, closed its mints to the white metal. And then came other changes, until to-day the bullion value of an American silver dollar is less than fifty cents. Keeping pace with these conditions wheat which was \$1.30 in gold in the New York markets in 1873 has within the month dropped in the Chicago market to less than 60 cents a bushel. From this data it would be interesting to point out the general decline that has taken place in the prices of all other agricultural commodities, and, in fact, of nearly all commodities, since the first demonetization of silver in 1873, but this is hardly the place for such a discussion. The thought is, nevertheless, suggestive, in view of the parallel lines in which wheat and silver have been running since 1873.

In view of these changing conditions—ever changing—is it not idle just now to theorize or conjecture on possibilities of the future?

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—Steady, at 56c. north and west and 57c. bid, middle freights, for red and white. Spring wheat nominal at 60c. to 61c. east. Goose wheat, quoted at 55c. west. Manitoba wheat, No. 1 hard, North Bay, at 78½c. The same grade quoted east at 77c., and west at 74½c. to 75c., and at 78c. grinding in transit; No. 2 hard is quoted at 75c. east and 73c. west. Montreal: Wheat, No. 1 hard, 76c. to 78c.; wheat, No. 2 hard, 72c. to 74c. Chicago: February, 57½c.; May, 60c.; July, 61¾c. to 61½c. St. Louis: 55c. for cash; 54¾c. for February; 57¼c. for May; 58½c. for July. Duluth: No. 1 hard, 61¾c. for May; 63c. for July; No. 1 Northern, 60¾c. for May; 61¾c. for July. Milwaukee: 57½c. for cash; 58½c. for May. Toledo: 57½c. for cash and February; 60c. for May; 61¾c. for July; No. 3, soft, 55¾c.

BARLEY—Toronto—No. 1, outside 42½c. to 43½c. Feed west quoted at 36c.; feed east, 37c. to 37½c. A Buffalo dispatch of Feb. 26th, says of American barley markets: "The visible supply of barley has decreased 156,000 bushels during the past week and is now rated at 1,216,000 bushels, and is now 656,000 bushels below the quantity reported at this date last year; there was some increase at primary points, notably at Milwaukee, where stocks now reach 114,744 bushels, but at Buffalo and New York stocks have considerably decreased. There is now but 363,153 bushels of barley in store in Buffalo, a decrease of the week of 122,880 bushels, and stocks are now 214,897 less than on the corresponding date last year and a considerable quantity in elevators is sold and held to await maltsters' orders. To-day there was an active enquiry at Buffalo, but sellers are stiff at their views for low grade stocks, of which there is not much now on hand. The market, however, is distinctly strong for all grades and the week will probably end with a fair record of trades."

OATS—Toronto—Car lots of mixed and white, west, quoted at 32c. Buffalo, No. 1 white, 35c. to 35¾c.; No. 2 white 34¾c.; No. 3, white, 34c.; No. 2, mixed, 33c.

PEAS—Toronto—Prices steady, car lots wanted at 53c.

RYE—Toronto—Car lots wanted at 45c., offered at 46c.

BUCKWHEAT—Toronto—Car lots east offer at 43c.; 40c. bid. A New York market report of February 24th says: A car of Canada grain sold recently at 68c. free for prime, or equal to 53c. in bond. But really there is no demand for it. Flour is bid \$2 by city mills, and offered at \$2.25 for pure. Sales, 150 bbls., \$2.30.

THE FLOUR MARKET.

THAT one might vary the story—but stillness and dulness continues. There is very little business doing in flour either locally or for export, enquiry among the mills show-

ing, as Mr. M. McLaughlin states in an interview in another column, that a large number of the mills are not working to nearly the full capacity. The flour output of the Minneapolis mills showed a small increase for week ending Feb. 17th over previous week. Export trade was also reported a little better. The Northwestern Miller says: "Millers have advices from London saying that the stock of flour there amounts to 500,000 280 lbs. sacks, but fully half of this is represented as being old stock that is wholly out of condition, upon which 20s. or more in charges have accumulated. This stuff, while not salable, is counted as so much flour in sight, and exerts a correspondingly depressing influence on the market. This feature in no small degree corresponds with the position of the heavy stock of wheat in the United States, a large portion of which is accessible to the miller. In considering the high prices paid for cash wheat, attention is called to the fact that where patent flour is now selling 20c. per barrel lower than at the opening of the crop, and bakers' 30c. lower, cash wheat is within 2½c. per bushel as high as it was at that time. Nothing more conclusive could be adduced to show how prime milling grain is regarded. The direct export shipments by the mills last week were 22,975 bbls., against 22,660 bbls. the preceding week. London quotations, per 280 lbs. c. i. f., are: Patents 22s. 3d. to 23s. 3d.; bakers', 15s. 3d. to 15s. 9d."

PRICES OF FLOUR AND MEALS.

TORONTO.—Car prices are: Flour (Toronto freights)—Manitoba patents, \$3.70 to \$3.75; Manitoba strong bakers' \$3.45 to \$3.50; Ontario patents, \$2.90 to \$3; straight roller, \$2.65 to \$2.70; extra, \$2.40 to \$2.50; low grades, per bag, 90c. to \$1. Bran \$15. Shorts \$16.

MONTREAL.—Flour—Spring patents, \$3.60; straight roller, \$3.10 to \$3.20; extra, \$2.75 to \$2.80; superfine, \$2.60 to \$2.70; fine, \$2.25; strong bakers', Manitoba, \$3.40 to \$3.50; strong bakers', Manitoba, best brands, \$3.50 to \$3.60. Meal: Granulated and rolled, per brl. \$4.25 to \$4.30; granulated and rolled, per bag, \$2.10 to \$2.20; standard per barrel \$3.90 to \$4; standard, per bag, \$1.90 to \$2. Feed—Bran is scarce and high-priced. Shorts are steady at \$17 to \$19. Bran \$17 to \$18; shorts, \$17 to \$19; mouillie, \$20 to \$24.

COMPLICATION IN FREIGHT RATES.

A REDUCTION of 5c. in the rates for oats from Ontario points to Montreal was announced by the Canadian Pacific Railway a few days since. The local rate was 21c., but the C. P. R. put it down to an export basis. The effect was to at once induce large purchases on the lines north and west and middle freights at an advance of 2c. to 3c. and one local firm estimates that 100,000 bushels were bought for shipment east at 34c. to 35c., besides which 10,000 bushels in store, Montreal, were sold at 39½c., 40c., and 40½c. The next day the C. P. R. notified buyers that they had restored the rate to 21c., and the result was that bids were at once dropped again 2c. to 3c. The temporary reduction in the rate was said to have been due to some misunderstanding on the part of the C. P. R. authorities, who, having heard a report that the G. T. R. had reduced its rate in some other case, made the reduction in oats to meet the opposition of its rival. When it was found that there was no foundation for the reported reduction by the G. T. R., the rate on oats was at once restored. The C. P. R., says the Globe, has gained an advantage, however, as large purchases of the grain have been made for prompt shipment at the reduced rate quoted by the railway, and local grain men say there is no doubt they will be given the lower rate, as the large purchases were undoubtedly made in the expectation of getting the freight 5c. lower.

FLOUR CONSIGNMENTS ABROAD.

UNDER the title "Killing the Goose," our Liverpool, Eng., cotemporary, Milling, says, or permits one, "Urbanus," to say: "This title is not suggested by the late festive season, but by the present policy of the transatlantic miller, whose golden eggs have ceased to come. It is no part of our business, nor is it here intended, to preach a homily to our neighbors; they know their own business, and the apothegm holds good that it is usually safer to take advice than to give it. It may, however, be possible to learn something to guide us in our actions from what befalls the actions of others. The wise man, it has been truly said, learns from the experience of others; any fool can learn from his own. In this view of things we may analyze the causes of those frequent complaints made by our good neighbors, or competitors, that the United Kingdom will not buy foreign flour except as a dead bargain. We will not buy it on spot unless the price is that of a glutted market; nor will we buy it forward, because we know there is an immense bulk here; that there is plenty more coming on consignment; that there is no other outlet of

any account in Europe; that Minneapolis mills did not stop as proposed, after all; that the rail freights at the other side are reported as almost as low as the normal rail-and-lake rates, so that flour will still come in, right or wrong.

"It is interesting to consider why the usually far-seeing Yankee has provided us with flour so persistently in spite of the low prices. First, there is the necessity, that so many are under, of keeping on shipping so as to get into funds by draft against bill-of-lading; and the continent being closed by tariffs, these islands constitute the only dumping-ground worth mentioning. Once this system of consignment is commenced, there is no option but to continue it, profit or no profit. Many of the consignors are semi-insolvent, and their only resource is to ship and draw against documents, because it puts the consignor immediately into funds wherewith to meet his liabilities for wheat. The States miller has wisely resolved to sell on a cash basis, and as he cannot get the cash at home, he has had to come here for it or stop his mill, an alternative which many are not solvent enough to adopt. But there is another reason, not so obvious, which has actuated the solvent, perhaps, as much as any other, the very narrowness of the margin. Only by increasing the quantity manufactured can they reduce the proportionate trade and manufacturing expenses, in other words, the cost per sack. The less the profit, therefore, the more has had to be ground. This is freely admitted in the American journals, and the increased output of the past two years is probably very much the result of this resort. For the year ending August 1st last 9,349,615 barrels have been shipped to us, and the year before 7,500,654, more than 2,000,000 increase over 1890-91, an amount far in excess of that shipped in those years when the margin was admittedly better. The last half of 1893 was, they all aver, far the worse; and for the four months succeeding June the States export reached the quite unprecedented total of 6,412,904 barrels, and the total for the year is about 8,000,000 sacks.

"Considered as a business policy, the expedient is sound so long as there is the smallest margin, and the tendency to enlarge the mills everywhere shows that the mercantile mind generally has grasped the situation; yet it may become a suicidal policy under exceptional conditions, because nothing depresses prices like over-production, and once go down to a fractional loss, the larger the output the worse. An export regulated by the demand means profit. One based on reducing the average cost of production per sack, by extending the output entirely regardless of consequences, means killing the British goose that, with patience and nursing, would be a producer now, as in the past, of golden returns. It is destroying the very source of profit, and must be economically unsound, as it is certainly disastrous to the American miller. The moral for British and Irish millers is not to look exclusively, or even primarily, at the magnitude of output, but, while keeping it in view, to see with one eye at the same time whether the stuff can be placed to advantage. A little excess of stock over requirement does more at any time to put down prices, and to hold them down, than even the certainty of a bad harvest."

UNFAIR TRADING.

ONE of the most reprehensible practices which have arisen out of the keen competition of the times, says the Australian Miller, is that of dividing profits with a customer in order to cut into the trade of a competitor. Besides accustoming people to a scale of prices which is entirely incompatible with reasonable profit, thus demoralizing trade, it is the baneful source of competitive strife which often leads to the most extravagant limits, and ultimately to all kinds of adulterations and sophistications, from which traders and customers are alike sufferers.

EXECUTORS' SALE.

In our advertising columns will be found an announcement of the intended sale of the valuable mill properties of the late James Norris, St. Catharines, Ont. These consist of the well-known "Norris" roller mills on the Welland Canal, St. Catharines. Mill "A" has a capacity of 400 barrels, and mill "B" of 325 barrels. Both mills have ship elevators, and most complete shipping facilities. The Fyfe mills, at Thorold, are also included in the properties offered by the executors. These have a capacity of 160 barrels daily, and are constructed on the full roller process. Additional to the mills and milling property, the steamer Persia, which has for years done a large freight and passenger business between St. Catharines, Toronto and Montreal, will also be sold. The steamer has always been found a valuable adjunct to the business of the mills owned by Mr. Norris. Altogether the opportunity is an exceptional one for the right person to enter into a large and profitable milling trade. All particulars are given in the advertisement.

THE NEWS.

CANADA.

—Guelph citizens are thinking of erecting a grain elevator.

—P. McConnell, flour and feed, Melita, has moved to Deloraine, Man.

—The boiler of a steam flour mill, at Marquette, Man., exploded, killing the engineer, John Reid, instantly.

—John Heath's flour mill and contents, at Wardsville, Ont., were completely destroyed by fire on the 15th inst.

—The premises of F. Millette, flour and grain, Windsor Mills, Que., were destroyed by fire a few weeks ago.

—The Calvin Company are building a new barge at Garden Island, Ont., which will carry 30,000 bushels of grain.

—John Plewes, of Flesherton, Ont., purchased the grist mill at Mansfield, and will fit it up in good shape for trade.

—Supt. White is quoted as authority that the C.P.R. elevator in Winnipeg will be built in time for this year's crops.

—The roller mills of Alvin T. Drake, at Byng, Ont., were destroyed by fire a few days ago. Loss, \$12,000; insurance, \$1,300.

—Mattawa citizens, at a public meeting a week ago, passed a resolution to take steps toward the erection of a grist mill in the town.

—The flour mill of Hammond and Leckie, at Hartney, Man., is said to be one of the best constructed mills in that section of country.

—Mustard's roller flouring mill, at Wyoming, Ont., was burned to the ground on the 1st inst. Loss about \$12,000; insured for \$3,000.

—Mr. Wood, of Cargill & Co., Armstrong, is considering the advisability of putting in a grist mill at Vernon, B.C., to be run by water power.

—The grain warehouse owned by W. B. Collins & Co., situated across the railway track, was set on fire from the mill, and with its contents became a total loss.

—Ratz Bros., of Tavistock, Ont., intend to remain active buyers of grain, pending the re-building of their mill, which was destroyed a short time since by fire.

—J. W. Cochrane, of Glenboro, Man., writes the MILLER: "I have just completed and started my 150 barrel roller flour mill at this place, and it is doing splendid work."

—Alfred Shaw contemplates moving his roller grist mill from Nevis to Hawkestone or Mitchell Square, Ont., with the view of running it with water power instead of steam.

—Wm. Welsh was caught in an endless belt in his grain elevator at Stony Point, Ont., and was so severely injured that the doctors entertain very little hopes of his recovery.

—The Fort William people are endeavouring to influence the C.P.R. to revoke their supposed decision to erect a big elevator at Winnipeg, and make Fort William the choice.

—J. D. Sibbald has withdrawn from the Western Milling Co., and will commence business in Revelstoke, B.C. Mr. Spring Rice is now acting president and manager of the company.

—The visit of the Australian delegates to Ottawa to confer with the Canadian Government with respect to the enlargement of the trade relations between Canada and Australasia has been fixed for June 21st.

—Rumour has it that quite a few Montrealers were scorched severely through the recent drop in Chicago wheat. In some cases, it is said, personal property had been sacrificed in order to cover Chicago losses.

—Thos. McClay, flour and planing mills, Woodstock, Ont., is asking an extension from his creditors, four, eight, twelve and sixteen months. McClay shows liabilities of \$19,525 and assets \$39,000, and it is quite probable the extension will be granted.

—The Assiniboia Roller Mills, at Moosomin, Man., will be closed down the end of this month. This step has been necessitated through the death some time ago of Mr. C. J. Smith, of Ottawa, who was the senior member of the firm of owners, on account of which the estate must be closed out.

—R. C. Scott, miller, Highgate, has made an assignment for the benefit of his creditors. Aggregate liabilities amount to \$32,000. The mill property is worth \$20,000, but outside of this the assets are small. H. Hollingshead, miller, Dutton, has been appointed assignee. The mills were established in 1880.

—Leon M. Carrier's case is still before the courts in Quebec. The absconding broker was brought up in the police court to-day and pleaded not guilty to eleven different charges, all of which were for disposing of flour and provisions to the amount of \$35,000. Proceedings were again adjourned owing to the absence of a material witness.

GENERAL.

—The Farmers' Mutual Elevator Company, owners of six elevators at Crookston, Minn., has gone into the hands of a receiver.

—In Ohio the food inspector recently discovered that flour was being adulterated with bone dust. This is a new scheme. The sale of the flour was stopped and bakers warned.

—Already there is a demand for tonnage to carry wheat from Duluth to Buffalo. A week ago contracts were made sufficient for 500,000 bushels at 2½ cents. The winter has not been severe and the expectation of an early spring has prompted early charters.

—A despatch from Topeka, Kan., says: "The grain men here say the recent heavy snow will make a wheat crop of 100,000,000 bushels in Kansas despite the low price of wheat and the dry weather last fall. The area seeded was over 4,500,000 acres, according to the latest report of the State Board of Agriculture."

PERSONAL.

Mr. W. W. Ogilvie has been re-elected president Montreal Board of Trade.

Colin Wigle, miller, Amherstburg, Ont., was married a week ago to Miss Susanna Dibbs, of Petrolia. The happy couple honeymooned in Southern Ohio.

Universal regret will be experienced in milling circles, as well as in his own immediate locality, with the news of the death of Patrick Kelly, of Blyth, Ont., which occurred on the 14th inst. The deceased was one of the best known millers in the London and Huron territories. He served faithfully and intelligently as a member of the executive of the Dominion Millers' Association, and at the annual gatherings of the association, with his quaint brogue, and characteristic Irish countenance, his was a marked figure. Mr. Kelly had been in poor health for a year, and at the time of death was about 63 years of age. He had been a prominent figure in public affairs in Huron county for the past quarter of a century, and his name was familiar in almost every household. He was a man of good natural ability and of indomitable pluck and perseverance. He was successful in business, and was one of the founders and leading men in the village where he lived, and it owed much of its success to his energy and enterprise. It was due to his exertions in no small degree that the London, Huron and Bruce Railway was built by its present route. In religion he was a Roman Catholic and in politics a Conservative. He was an intimate and trusted friend of the late leader of the Conservative party, Sir John Macdonald, and many amusing anecdotes have been related concerning the doings of the two men when they met to plan for party interests. He has always taken a prominent part in municipal and local affairs. He was long a member of the County Council and for a year or more he was warden of the county. He also contested West Huron for the Legislature in the Conservative interests, but was not successful.

THE DOMINION BAG COMPANY, LIMITED.

In the Dominion Bag Co., Limited, with headquarters at Montreal, we have an old and worthy concern under a new name. The business was started by A. W. Morris & Bros., and afterwards operated by the Consumers' Cordage Co. For five years past the business has been managed by Mr. John L. Galletti, who now becomes managing director of the new company. This is a substantial guarantee of the character of the work that will be executed by the Dominion Bag Co. The quality of the work that had in the past borne the imprint of the Consumers' Cordage Co. is well known to the millers of Canada, and has, we have reason to believe, always met with their approval. We may expect that this high standard will be fully kept up, and doubtless surpassed, the working staff, as well as the management, remaining absolutely unaltered. Mr. Chas. A. Smart, favorably known on the road, will continue to represent the firm. Messrs. Merrick Anderson & Co., of Winnipeg, who have represented the business in Manitoba ever since its opening will continue to look after affairs in the Northwest.

OPERATIVES DO NOT STUDY.

THERE is a dearth of trained and educated millers—trained and educated in the business we mean—yet there has been time since the advent of roller milling for the education of almost any quantity, says Milling, of Liverpool. Since that time the principles of milling have not changed, although the details are being gradually rendered more perfect, yet how few of our operatives take any pains to qualify themselves by studying either principles or details, except such as they meet with within their daily work:

STEAM
PUMPSDuplex
AND SINGLE
Steam
AND POWER
Pumps

If you require a pump for any duty, of the latest and most improved pattern, and at close prices,

WRITE US



NORTHHEY
M'FG CO.
LIMITED
TORONTO - ONT.

MILLING AND HARD TIMES.

WE speak in every day parlance of certain lines of business as providing only the luxuries of life and for this reason suffering more severely when hard times take hold of a community. Drawing this distinction between necessities and luxuries it is hard to name any business that meets so completely a necessity for all people and all communities as that of the milling of flour. The Good Book is doubtless correct when it tells us that man cannot live by bread alone, but it is quite true he cannot live without it.

Moved likely by thoughts of this character Milling, of Liverpool, has the following suggestive paragraph: "Is it a fact that, during periods of extreme trade depression, mills and millers are more than usually busy? This statement was strongly emphasized by a delegate on a recent deputation, and from inquiries we have made there appears to be some foundation for it. We heard it repeated the other day by a Liverpool flour salesman, and certainly at the present moment, although trade in some parts of Liverpool is very bad, and there is much distress among some classes of work-people, the consumption of bread is now above the average. Most, if not all, of the mills in Liverpool are working full time, and the demand for local flour continues in a steady and healthy condition. The bakers also are mostly working to their full output; some are making extensions to meet increasing demands, and all seem fairly satisfied with the present state of the trade."

On this the American Miller comments thus: "Of course, millers neither here nor elsewhere have a talisman that protects their business from the vicissitudes caused by panics, over-production or other malign influences on trade. They encounter exactly the same difficulties in the conduct of their business that are met with in other lines; they make bad debts, find collections slow and meet destructive competition. But the industry has one very decided advantage which accrues to the industry as a whole, if not to its individual members. It deals with a staple whose consumption is an almost constant factor. Iron, cotton and woolen goods and lumber are staples, but their consumption fluctuates, iron the most, and cotton the least; but the fluctuation in the consumption is often disastrous to the producers.

"Carefully collected data from a number of leading industries show an average falling off in sales the past six months of about 29 per cent. In some lines the decrease is nearly 50 per cent., and in some it is as low as 10 per cent. In only one line has an increase been noted, groceries. The increase is insignificant in amount, namely, one per cent, but very significant as showing the limits of the economies practiced by the people, rich and poor alike. The sales of flour and cereal foods have probably increased. Household economies are not effected in the matter of flour. Probably many mills have sold less than usual; but this is not a decrease in consumption, but in the stocks carried by grocers, jobbers and even families. The actual amount of flour consumed was probably larger the past six months than at any time in the history of the country, because our population is larger.

"In the 'spell' that followed the panic of 1873, milling was not depressed to any extent. In fact, when measured by the profits of to-day, that was a golden age in the industry. The same causes that removed milling then from the circle of commercial disturbance are operative to-day. We are beyond the reach of foreign competition in flour, and the production of a staple of almost invariable regularity of consumption can hardly fail to insure moderate prosperity to the industry at large, whatever misfortunes may overtake individual members."

MECHANICAL ARTICULATION.

TO make a sound by steam power loud enough to be heard ten or fifteen miles for signal purposes, as in the case of the steam siren, a 10-horse power boiler is used that must be fired for all it is worth, for it takes steam to furnish lung power for a device of this kind, says the Boston Journal of Commerce. The steam is allowed to rush direct into the open air from a valve in the horn that opens and shuts 250 times in a second to give a pitch that will correspond with the human voice. The trouble with sound like this is that it is too regular, with all the pulsations just alike and calls for interruptions similar to those found in telegraphy to give signals. What is wanted is to rig up some way to have perfect control of every pulsation on the opening and closing of the valve for every discharge of steam, that the horn may work more like the telephone; in fact, make the steam siren speak for itself by working on the phonographic principle. A single word is composed of no more vibrations than there are pulsations made by the steam horn during the time it takes to pronounce it. This number could be spaced off on the rim of a large wheel as though intended for teeth to a gear, and a tooth cut for every space that will open and close the valve on its own hook independently of all the others; then when the wheel is given a single revolution each tooth will act on the lever of the steam valve in their regular order and produce the word they have been shaped out for. With a set of no more than twelve wheels quite a conversation could be kept up by simply changing the lever opening from one to another, as the case may require, but who will attempt to shape the first valve wheel? Already a sectional view of a phonographic cylinder has been made that will show the styles perfectly, and has been magnified and photographed till the vibrations for a single word can all be traced on a 12-foot circle. This ought to be large enough for any mechanic to be able to reproduce on a wheel 2 feet in diameter with a one-eighth milling cutter quite closely on the pantographic principle, and given the siren a distinct articulation. The first time it may sound a little hoarse, but might improve in this respect as the surface of the valve wheel wore smooth.

DESIGNING vs. MAKING.

IT is very easy to tell by a quick, searching glance whether a piece of machinery has been "designed" or only "made," in other words, whether the plans have been carefully studied and weighed for convenience and cheapness of manufacture, or whether they have been neglected and the machine built piecemeal, making the latter parts fit the first ones. This is too often the case with some machinery, and we find to our sorrow when we come to repair or replace some part, that what should be a minor repair necessitates taking down the whole machine to get at the piece to be replaced.

This counts against a machine when the repair bills are charged to it as should be the case in a well organized shop, and probably prevents another order for this machine being placed when another is wanted. It will pay to look your machine over and see if there is not some part which comes under this head and that can be improved, and these little improvements in get-at-able-ness all count in a machine's favor with the men who have them in charge.

MILLING in Germany is now considered an unremunerative industry, more especially as the new treaties with Austria-Hungary and Italy bring greater competition than ever. The German millers have now therefore arrived at a point when the surplus production is so great that millers sell flour to their buyers at two, three or five months' credit, even with the clause that the buyer shall have the advantage of any decline that may supervene; but the seller may take no advantage of any rise.

STRENGTHENING OLD BELTING.

BY means of an ingeniously arranged apparatus the strength of old belting is now renewed or augmented to such a degree as greatly to lengthen its service. To accomplish this, two large, hollow copper cylinders are provided, and into these steam is admitted, so that they are always heated. In a tank is a solution composed of beeswax, borax, glue, starch and molasses, prepared in equal quantities, the solution being in liquid form; and there are guide rollers, through which runs the leather belting, which is in process of treatment. The belt to be operated upon is started into the machine at a point where it can enter the tank, and while passing through the latter the leather receives an application of the solution; the press rollers immediately squeeze the compound into the fibre of the leather, and then the heat from the cylinders, over which the belt is being drawn, dries the compound. All the rollers and cylinders rest in the bearings. As represented, the application of this compound to the belt, and immediately drying, is to add strength to the fibre of the leather in a remarkable degree.

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AS MILLER—CAPABLE OF TAKING charge of roller mill, any capacity; married; steady and temperate; can furnish good references if required; open for engagement immediately. Address, T. C. Miller, 51 Brock Avenue, Parkdale, Toronto.

MILLER WANTED

WANTED. A GOOD MILLER TO MANAGE a 75 barrel mill. Must be competent man and single. Address

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EXECUTOR'S SALE

OF THE

"Norris" Roller Mills, St. Catharines;
"Fyfe" Mills, Thorold, and the
Steamer "Persia."

TO LIQUIDATE THE ESTATE OF THE late JAMES NORRIS, the executors have decided to sell the following properties:

MILLS "A and B," on the Welland Canal, St. Catharines, Ontario. Capacity mill "A," 400 barrels; "B," 325 barrels. These mills are on the direct line of water communication between Chicago, Duluth or Fort William and Montreal, and enjoy the benefit of water rates on all grain inward, and flour outward. Both mills have ship elevators capable of handling 1,500 bushels; large flour and feed storage. Steamers can load for Montreal and way ports direct from the flour warehouses at mere nominal cost. Brick cooper shops and ample storage for coopers stock and barrels. These mills are full roller process, thoroughly modern in all their appointments, and are running daily. The brands manufactured are registered, and are well known throughout Canada and Great Britain, and are standard wherever used. The mills enjoy a large and profitable local business. Never failing water power, costing only \$200 per annum. There is 400 feet dock frontage on the Welland Canal. On the property is a large two-storey stone warehouse, now used for the storage of merchandise in connection with the steamer "Persia." Could be utilized for other purposes, or extra flour and grain storage. Entire premises electric lighted by a modern Thomas-Houston incandescent plant belonging to the property, and at a very small expense over cost of lamps.

STEAMER PERSIA—This boat is in excellent condition, and has always done a large freight and passenger business between St. Catharines, Toronto and Montreal. The "Persia" is a valuable auxiliary to mills "A and B," enabling them to deliver flour at seaboard at a very low rate of freight.

FYFE MILLS, on the Welland Canal, Thorold, Ontario. Capacity, 160 barrels daily. Full roller process. Never failing water power, summer and winter. Water and railway communication. This mill will be sold cheap, and offers a capital opportunity for any practical miller.

For further particulars apply to EXECUTORS ESTATE OF JAMES NORRIS, St. Catharines, Ontario.

Best Box Metal

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Stands any Gait,

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The President, James Goldie, Esq., in moving the adoption of the report on the business of 1892, said: I have much pleasure in drawing your attention to the fact that this company has verified, in a marked degree, every expectation set forth in the original prospectus when organized in 1885.

Up to the present time the insurers with this company have made a saving, when compared with the current exacted rates, of \$91,004.20. And in addition thereto bonus dividends have been declared to continuing members amounting to \$21,522.72.

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserved (based on the Government standard of 50 per cent.—(50%), a cash surplus of 1.93 per cent. to the amount of risk in force.

Such results emphasize more strongly than any words I could add the very gratifying position this company has attained. I therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted, and the retiring Directors unanimously re-elected. The Board of Directors is now constituted as follows: James Goldie, Guelph, president; W. H. Howland, Toronto, vice-president; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

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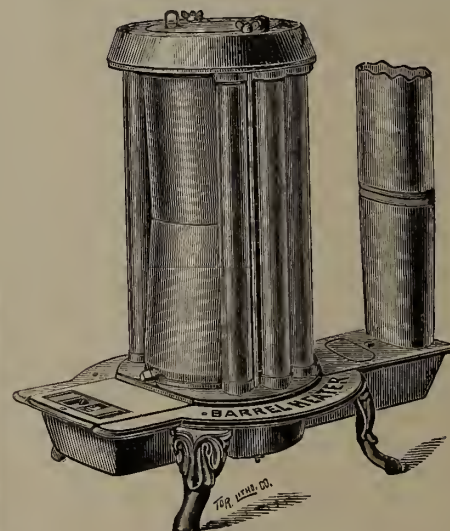
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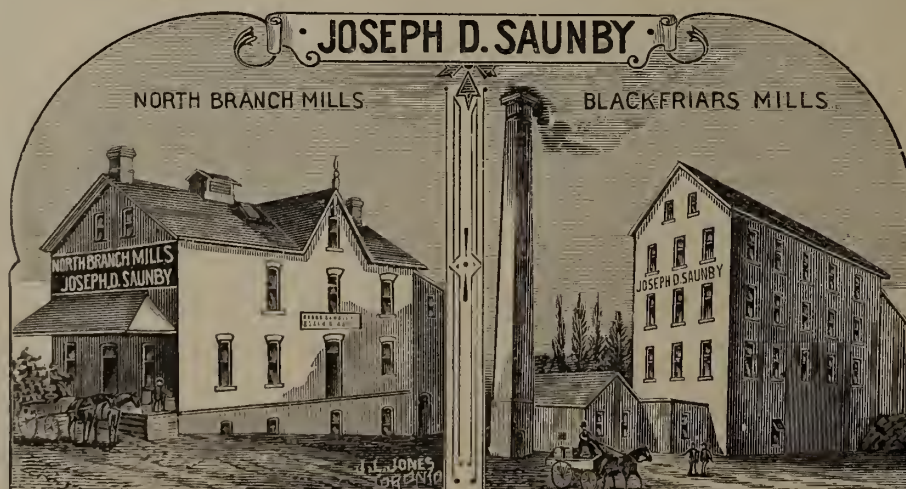
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NORTH AMERICAN MILL BUILDING CO.,
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GENTLEMEN,

The mill that you completed for us last November started up and run ever since without any changing. We find the mill turns out easily 135 barrels in the twenty-four hours, although the contract called for only 100 barrels.

Now, we do not believe in puffing up a firm too much, but in this instance, after our experience of twenty years' milling, we have to confess that in your cleaning machinery, rolls and separations you certainly stand at the head of the list of all mill-builders. If anyone does not credit this, let them come to Forest, and we shall be pleased to show them through a model mill both in equipment and manufacturing. If your firm continues under the same management, we feel satisfied no one will regret to leave their order with you as far as first-class machinery and fair-dealing goes.

Yours respectfully,

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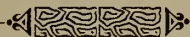
North American Mill Building Co., Ltd.

STRATFORD, ONT.

THE PLANSIFTER COMPANY OF CANADA LIMITED

SOLE MANUFACTURERS UNDER THE CARL HAGGENMACHER'S PATENTS

STRATFORD, ONT.



The following paper was read by JOHN LANDES, of Arkansas City, Kan., before the Millers of the South Western States in convention at Kansas City, Mo., January 23rd and 24th, 1894:

SOME two years ago our company decided to increase the capacity of our mill from 500 to 800 or 1,000 barrels. To do this we had to enlarge the building, which was done that summer. This made room to move out the packing and cleaning machinery, leaving the original building 40x50 feet in the clear, and four stories and basement for flouring machinery exclusively.

As I was in charge of the mechanical department, I started out by increasing the necessary roll capacity. Then came the question of providing the necessary scalping and finishing reels. To make our 500 barrel mill we had thirty-five scaplers and finishing reels, which pretty well filled up the floors above the grinding floor. To nearly double the capacity I saw visions ahead of the floors solidly full of reels and scaplers; but, just at that time, and before beginning the task, our company suggested that it might be wise to investigate the plansifter. I caught on to the suggestion like a drowning man to a straw and started out on my mission.

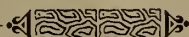
After visiting several mills and the manufacturers' shops, and seeing the work of construction and the separations, I was convinced in my own mind that the plansifter was the coming bolting device, and so reported to my company, who had faith in my milling judgment (whether deserved or not), and after due consideration we ordered four machines, for four breaks. Each machine was guaranteed to handle each respective break for 1,000 barrels in twenty-four hours and to make all the separations complete without rebolting, which they did. The break flour is clear and good color, with three grades of middlings from each machine, thoroughly dusted and ready for the purifiers.

After starting the four machines I had the pleasure of dropping twenty reels and scaplers, with the capacity doubled. We then decided to order two more machines for the first reduction of middlings. After starting the last two machines mentioned, we dropped out nine more sixteen foot reels. The six machines are on the upper floor of the mill, and occupy a space 35x15 feet, and the six are running with an eight-inch belt. We have fourteen reels and centrifugals left out of the original thirty-five, and we have nearly doubled our capacity. These fourteen reels we use on finishing up. So, gentlemen, you will see that my vision of the floors being full of reels, was never realized; besides we have made a great saving in power. The question will now be asked, do they shake the building? To this I can say, that if not properly set up and handled, they will shake the building. But where a steady and uniform motion is maintained, and the machines balanced, they will not impart any more tremore to a building than other machinery. We have been running our machines something over a year now, and the flouring cloths are yet good. The sieves that dust the course middlings have had to be reclothed, but the cost for one sieve is only about \$9, while it costs about \$20 to \$30 to clothe a reel, and then you would not have as much capacity.

There is one item I am constrained to mention, and that is in reference to the many inquiries I have received by mail, asking about the plansifters. Many of these inquirers seem to have the idea that a plansifter constitutes a whole mill, and want to know whether they will make all patent flour or not, and if it is three or four grades better than flour made on reels. In answer to any such questions I have simply to say: The plansifter will do the work it is designed to do and do it well, but it will not correct improper grinding or purification. If the wheat is not thoroughly cleaned and tempered and the reductions are not even, so as to secure an even round middling, which should then be well purified, I contend that any deficiency in this line cannot be overcome by any bolting device, entirely.

I might say more about the machine, but as I have given my practical experience, I will not take up the time of the meeting further than to say that I believe the plansifter, while it may have to fight its way, has come to stay.

We invite all who are interested in Milling to call and see a full 350 Barrel Plansifter Mill in operation in Stratford, Ont.



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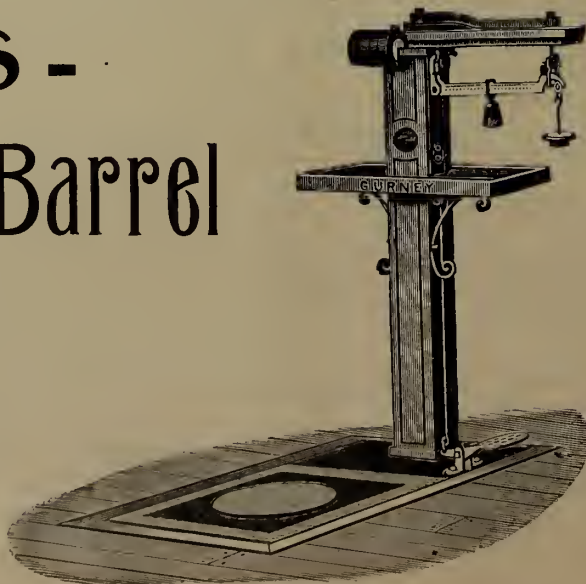
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With Improved Drop Lever

Capacity, 600 lbs. Platform, 20 x 28 ins.

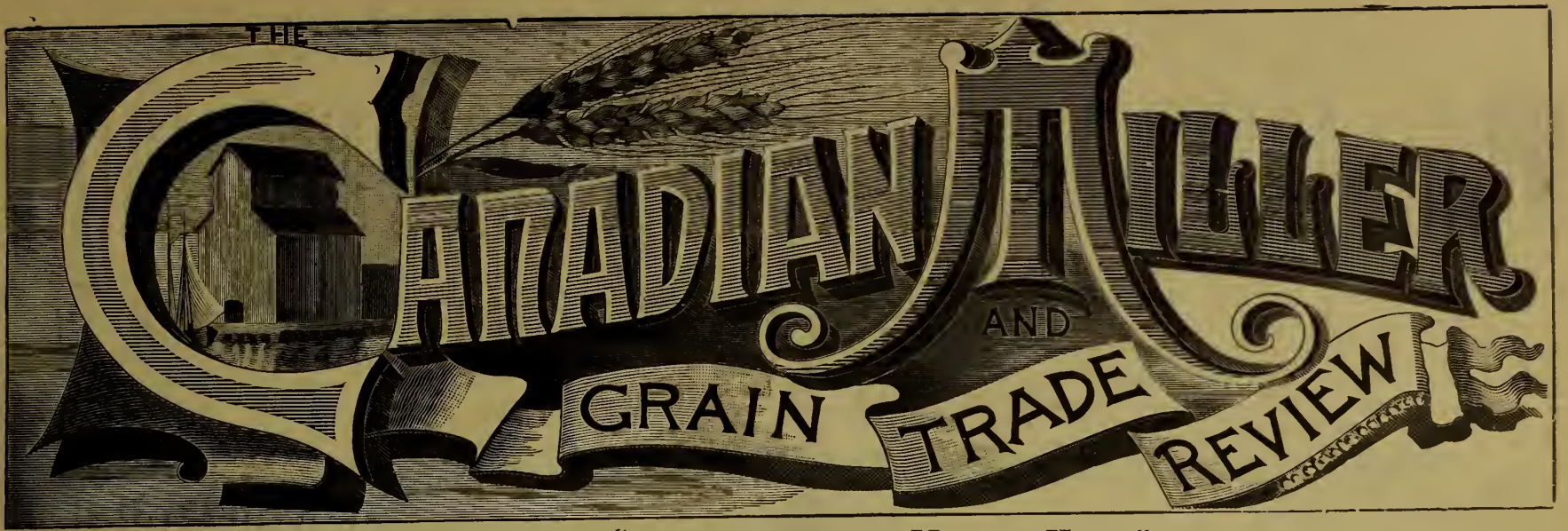


This Scale replaces the old style of "Flour-Packing Scale," and is superior to it in many respects

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OLD SERIES, VOL. XI. } NUMBER 3.
NEW SERIES, VOL. IV. }

TORONTO, ONT., MARCH, 1894

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ROLLED OATS



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GRANULATED OATMEAL

Made from Selected White Oats

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IS now issuing Licenses for the use of
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GENTLEMEN,

The mill that you completed for us last November started up and run ever since without any changing. We find the mill turns out easily 135 barrels in the twenty-four hours, although the contract called for only 100 barrels.

Now, we do not believe in puffing up a firm too much, but in this instance, after our experience of twenty years' milling, we have to confess that in your cleaning machinery, rolls and separations you certainly stand at the head of the list of all mill-builders. If anyone does not credit this, let them come to Forest, and we shall be pleased to show them through a model mill both in equipment and manufacturing. If your firm continues under the same management, we feel satisfied no one will regret to leave their order with you as far as first-class machinery and fair-dealing goes.

Yours respectfully,

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STRATFORD, ONT.

THE CANADIAN MILLER

OLD SERIES, VOL. XI. } NUMBER 3.
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ENGLISH VIEWS ON WHEAT.

WRITING on the characteristics of various kinds of wheat used in England, "Felix Holt" says in *Liverpool Milling*: The most interesting group of wheats with which we have to deal is what we term glutinous. These are produced chiefly on the interior plains of Europe and America and are, in many respects, similar, although for some reason, probably better farming, the American grain is almost invariably superior to Russian. The great advantage of the latter to the British miller is its general abundance and cheapness and, possibly, its great variety. This variety is troublesome to some millers, and sometimes the cause of fluctuations in the quality of their flour, which is quite unaccountable to them. The best of all Russian wheats is probably Saxonka, and the worst Novorosisk-Azima. Kubanka at one time was held in high repute as one of the strongest wheats, but, whatever might have been its reputation, there is little doubt that it has suffered a severe fall in public estimation. When roller-milling became fashionable, it was thought that hard wheats of all kinds were just the thing, the harder the better, and Kubanka was, par excellence, the wheat for the purpose. Those who tried it soon found that such wheat required far too much power to reduce it to flour, and that the results were not commensurate with the trouble. Since then there has been a further development, arising from the discovery that hard wheat is not the best for rollers any more than it is for stones, and that the best results are obtained from medium wheats, such as our conditioners now insure us. It is doubtful, moreover, whether Kubanka possessed all the virtues ascribed to it. The writer had a sample of a familiar wheat sent from America, with an inquiry as to its suitability for British millers, the sender stating that American farmers preferred to grow it, as it ripened earlier than other kinds, but that American millers would not use it, as it had no strength. There it was called "goose wheat." Whatever might be said about Russian Kubanka, there is no question that American Kubanka, grown from Russian seed, is by no means strong, in fact, its closest resemblance is to rice. We might compare it very well with the hard, flinty grains found in some samples of Bombay. To my mind the milder Ghirkas are far and away superior. But none of them probably are equal to first-class Saxonka, which partakes more nearly of the qualities found in American spring, that is, good, sound, tough gluten, which may always be relied on.

Some of the Ghirkas from the Black Sea provinces closely resemble Saxonka, but, being grown on the opposite side of the continent and in a somewhat milder climate, lack some of its qualities, although the better soils can generally be relied on. The same with the better sorts of Azimas, which, although autumn-sown, are by no means deficient in strength. There is one district of which we might almost ask, "Can anything good come out of it?" That is Novorosisk. For some, to us, unaccountable reason this wheat is seldom good, and often very bad. During the last two seasons many millers have had bitterly to regret using it in any proportion. Its characteristic appearance is clear and somewhat watery, which might be taken for strength. It has, besides, a rough nondescript appearance, and nearly always has large round black seeds mixed with it. Whatever may be the cause, it is very strange that wheat from this quarter, which has these large seeds mixed with it, is seldom very good. This applies alike to the variety known as Danubian, which, although better than the foregoing, is of rather low quality, lacking strength, although otherwise sound. The fault of the former is its deceptiveness. Not only will it not impart strength, but it will help to destroy any existing strength almost as

effectively as sprouted wheat. A very useful and cheap wheat, not over strong, but quite reliable, is Odessa and Dnieper Ghirka. They are rather foul and in some cases a bit thin, but the low prices makes them really cheap. There are mills working at the present moment using one-half to two-thirds of this wheat in their mixture with very good results. It may be thought that a small yield would counterbalance the apparent cheapness, but the fact that the yield does not fall below 70 per cent. is sufficient to disprove this. Being mild, they have to a large extent taken the place of English in many inland mills, and have thus proved of great assistance this season. The fault with them is, perhaps, the yellowness of the flour.

BREAD IN THE OLDEN TIMES.

AMONG the ancient Greeks bread was not simply an adjunct to, but an essential portion of, the principal meal of the day. The chiefs of the heroic period lived almost exclusively on two dishes, roast meat, over which a little flour was sprinkled, and wheaten bread. The flour was ground in a handmill by the female servant; it was then made into dough, a portion of salt added, and baked in a special part of the kitchen. Wheat bread enjoyed a great reputation in those days. Homer calls it the strength of man. Bread was the first thing set before a guest. It represented civilization, while meat was representative of the old style. When Odysseus fled for refuge to the palace of Alkinoos, bread is specially mentioned among the "dishes" set before him. In the historical Hellas bread played a similar part; it was one of the principal foods of the people, and was regarded as indispensable by the better classes, and certain kinds of it were looked upon in the light of luxuries. The place most celebrated for its bakeries was Athens; but we really know very little about the method of making bread there.

It is characteristic of the position which bread occupied as an article of food that the Spartans, at their mid-day meal, had wheat bread only on special occasions as a particular luxury. Solon ordered that those citizens who were fed at the expense of the State in the Prytaneion should have white bread only on rare ceremonies. In republican Rome it was the custom for each household to bake enough bread for its requirements, and not purchase, and even under the Cæsars, when there was a goodly number of bakers in the city, the better families adhered to the old style of baking at home. They possessed a separate room for baking, situated next to the kitchen; this room was called "pistrina" (mill), for it embraced the place where the corn was ground. Bakers were called "pistores" (millers) until the fall of Rome, although the two branches had been divided long before. In imperial Rome the bakers were divided into three classes, white bakers, milk bakers and sweet bakers. The white or wheat bakers were the chief, because they produced food, a means of nourishment; the milk bakers made buns and cakes; the third class were noted for their skill in the baking of tarts and all kinds of sweet confectionery eaten for dessert.

When we remember how closely butter is connected with bread at the present day, it is strange to read of the antipathy which existed against it in those times. Butter was never used as a food either in Greece or Rome: it was employed chiefly as a medicament, externally in plasters and bandages, internally much as we take cod-liver oil; had pastry been made with it, the Greeks and Romans would have rejected the confectionary just as we should turn up our noses at a tart made with train-oil. It is true that the Thracians ate it, but they were only half-Greeks. In imperial Rome there were, in addition to bakeries conducted by private

people, spacious state bakeries, which played an important part in providing for the wants of the people. The Roman ovens were just like those in use at the present time. A well preserved specimen was discovered during the excavation at Pompeii; it contained several charred loaves, on which the baker's name could be plainly seen, showing of what flour they had been made. The loaves of Pompeii weighed about two pounds; they were round and indented, to permit the breaking of them into eight equal parts. Similar loaves are made now in Calabria and Sicily.

THIS STRAINING AFTER YIELDS.

THE first new-process of patent flour was not made on a yield basis, says D. George, in *Roller Miller*; far from it. Rather it was made by a low system, contrary to the theory and practice of that time.

The yield question may not have actually knocked out the stone system, but it certainly did much to hasten its downfall. Hereafter, conditions may change, but to make the best possible yield will always remain a cardinal principle in milling.

Of course, the best possible yield is not a perfect yield, and is far short of our ideal; because, strange as it may seem, no miller has yet found that blessed spot, where the wheat is of one quality all the yield round, where the temperature never varies, where rain and fog and mist and every other sort of atmospheric humidity are unknown, and the sun shines clear from its rising even to its going down. Meanwhile, how many of us set our mills to suit ever-varying conditions?

The miller in charge of a 1,000-barrel mill does not want the packer to show only 800 just when he happens to have a visitor; nevertheless 20 per cent. must be taken off the output at times, not only to make a yield, but, what is of just as much or perhaps more importance, to keep the flour anything like uniform. To attain these two ends and at the same time get full capacity out of the mill every day in the year, is what most millers are constantly striving to do. But these horses won't pull together, except on rare occasions.

Come back to the main question—yields. Does this effort start in the middle or near the end of the system? I trow not. It starts on the first break and continues throughout the system. The patent is certainly not improved by it; the baker's come next; the super comes in somewhere; the low-grade or red-dog—call it what you will—must end the chapter. This is where the yield must be squeezed out finally; but at what cost!

Here is a better way: Take the conditions of wheat and weather into consideration, and make whatever percentage of patent the wheat will stand; the other grades will easily follow. Should the yield by this method not be so great—and there can be no cast-iron rule here that will work every day—the flour of all grades will be improved, to the better satisfaction and probable increase of the mill's trade and to the enlarging of the right-side ledger balance. Moreover the mill will act better and the boys work in better humor.

These arguments are familiar to many of us, yet most are forever trying to hold the mill above its real capacity and at the same time make a yield. Boys, one and all, it's simply impossible.

HOW TO DO IT.

TO maintain perfect regulation, place the engine in the hands of a competent engineer, who is capable of adjusting and keeping the engine in good running order. A good engine, or piece of machinery, placed in the hands of an incompetent person, will never give good service or economical results.

NOTES ON BELTING.

A LARGE proportion of the so-called accidents to belts, in which they jump from one cone to another, or run into neighboring gears, are due to excessive pliability. Owing to their greater lateral stiffness, thick belts are much to be preferred to thin ones. So much do I believe that the property of stiffness increases the life of belts that I make it a rule to use as thick a belt in all cases as the diameter of the pulleys will permit. A manifest advantage of belts made of two or more thicknesses of leather lies in the fact that imperfection of the leather will produce but little effect in a double or triple belt, while in a single it is fatal. Messrs. Lewis Bancroft have, in their experiments, demonstrated the fact that "no marked difference could be detected in the power required to run a wide double belt or a narrow light one for the same tension as modern speeds." And again, we see ropes up to two inches in diameter transmitting power with great efficiency, and with apparently but little loss of power owing to their thickness. Therefore a thick belt will be practically no less efficient than a thin one on account of its stiffness.

Many experiments have shown that the pulling power of belting for a given arc of contact is almost independent of the area of the belt in contact with the belt, and that it depends chiefly upon the sectional area of the belt, and its total tension; so that a triple belt will transmit about as much power as a single belt three times its width.

With wide belts, and belts running at high speed, it is especially desirable that the thickness should be increased. If thin belts are used at high speed, they almost invariably run in waves on the slack side, particularly if the load which they are transmitting changes suddenly. These waves frequently continue in the belt while it is rounding the driven pulley, so that one can sometimes even see light in places between the belt and pulley rim when standing in the proper position. This wrinkling of belt, and the snapping that occurs as the waves straighten out, wears it very fast, and causes the splices to part, frequently in a few months. The remedy for this trouble I have invariably found to be an increase in the thickness of the belt. When a sufficient thickness is used, the belt settles down on the same pulleys and under the same conditions to a long, steady curve on the slack side, and the wrinkling and snapping cease.

It would seem also as though a certain ratio of thickness to the width of belt should be maintained, particularly in high-speed belts, otherwise the belt is apt to chase from side to side on the pulleys. This chasing would seem to be due chiefly to the oscillation of the belt around its longitudinal axis on the slack side, the belt being thereby tightened, first at one edge and then at the other, each side as it is tightened tending to run toward the center of the pulley. This oscillation, and the resultant chasing, are almost sure to cease when the thickness of the belt is increased in proper proportion to its width. As an illustration of this principle, the writer has in mind the case of a belt 78 inches wide and 9-16 inches thick, running about 5,500 feet per minute, which could never be prevented from chasing from side to side on its pulleys for any length of time without the use of an idler pulley. This chasing was due to the oscillation about its longitudinal axis, which was caused by the small thickness of the belt in relation to its width. A belt $\frac{7}{8}$ inches thick and 72 inches wide, used on the same pulleys, was almost entirely free from the chasing, and I am convinced that an increase to $1\frac{1}{2}$ inches in thickness would have rendered it sufficiently stiff to permanently remove the trouble. It should be noted that the thicker belt proved to be far more economical, durable, and satisfactory in every way than the thin belt. If the principle is correct, of using thick belts on account of their lateral stiffness and consequent durability, it becomes of the utmost importance to determine the minimum diameter of pulley which can be used with a given thickness of belt, and still have the belt last well. The writer is quite sure that the double leather belts $\frac{3}{8}$ inch thick will last well and give excellent satisfaction on pulleys as small as 12 inches in diameter, as he has had many belts in use for years under these conditions. For some time past he has had a triple leather belt 12 inches wide, 0.56 inch thick, running about 4,500 feet per minute, with an idler pulley

pressing lightly upon it, and transmitting about 100-horse power to a pulley 12 inches in diameter. This belt has up to date given excellent satisfaction, and has already lasted much longer than the two double leather belts which preceded it.

Regarding the question of fastening the two ends of the belt together, I think it is safe to say that the life of belting will be doubled by splicing and cementing the belt, instead of lacing, wiring, or using hooks of any kind. When belts are subjected to the most severe usage, the spliced portion should be riveted, iron burrs being preferable to copper. For double belting, the rule works well of making the splice for all belts up to 10 inches wide, 10 inches long; from 10 inches to 18 inches wide the splice should be the same width as the belt, 18 inches being the greatest length of splice required for double belting.

CHEAP POWER FOR MANUFACTURERS.

IN a suggestive article on "The Economics of Electric Power," which appears in Cassier's Magazine for March, Mr. H. L. Lufkin, a prominent electrical engineer, draws a very striking picture of what has more recently been accomplished in the way of applying electric motors to the driving of machinery of all kinds. So much has been said and written in a general way of the convenience and economy of applying electricity to the driving of shop tools that specific facts and figures, derived from actual experience, are most welcome additions to the literature of the subject, and every power user must, therefore, needs appreciate the valuable reference data given in the article. One of the advantages of using electric motors is found in the fact that they may be connected to the machinery to be operated almost directly, without the intervention of long lines of shafting, whose friction losses alone often represent an appreciable item of expense. Referring to this feature, Mr. Lufkin says:

The apparent losses in shafting had always been vaguely estimated until the advent of the electric motor, by which, with the aid of an ampere indicator, these losses are readily and accurately determined. As a result of a test in some thirty shops of varied descriptions, made in 1890, it was discovered that 68 per cent. of the average power applied in these shops was consumed in the shafting. Some data recently very kindly furnished to the writer by one of the large electric companies, which, by the way, is furnishing current for operating about four or five thousand horse-power in electric motors, cover seventy-one shops. The totals of these shops showed that 121,524 watts represented the average total energy supplied, and that 84,700 watts were consumed in the shafting, etc., being 69.2-3 per cent. of the average power, thus approximately checking the tests of 1890. These friction losses in shafting in the mills and factories before referred to have been partially eliminated by means of grouping tools in sets and otherwise, driven by electric motors, so that entire sets might be completely shut down when not actually in use without interfering with the remainder of the shops, and long lines of transmitting shafting and belting between floors or from building to building have thus been dispensed with.

An interesting example of the economy derived from this grouping of tools is found in a factory now being equipped with an electrical transmission system. A preliminary experiment in this factory showed that the saving in fuel alone will certainly exceed 50 per cent. and possibly 60 per cent. In one recent instance a card, indicating fifty-nine horse-power, was taken from an engine driving a large machine shop, a blacksmith shop with pneumatic hammer, blowers, etc., a pattern shop, and numerous special tools on three floors of a building about seventy-five feet square. This card was taken with all tools idle, thus showing friction only. The same tools were rearranged and grouped into several sets, driven by electric motors, and under the conditions the average indicator card from the engine driving the dynamos which furnish the power for these same tools is about twenty-five horse-power, covering friction, power for the tools and all.

The convenience and flexibility of an electrical power transmission system are frequently commented on by

present users, from the fact that single tools or small groups of tools may be efficiently operated in isolated locations, or locations at considerable distances from the main power plant. The great saving derived in an electrical system owing to the intermittent use of tools, was long since taken advantage of by the builders of traveling cranes, and to-day probably ninety-nine out of every hundred traveling cranes installed are operated entirely by electric power, an independent motor being used for each of the several functions of the crane. Many foundries now work their jib cranes with directly geared motors, taking current, in many instances, from the same dynamo which lights the shops.

HOW MANY FLOUR MILLS?

HOW many flour mills are there in the country? is a question quite frequently asked. The Minneapolis Record has been gathering some figures on this point. It places the number in Canada at about 1,000. There are probably all told about 1200 mills in this country. In the States the number is placed at beyond 15,000. Pennsylvania leads all other States in the number of mills, there being 2,200; New York follows next with above 1,300; Ohio 975; Missouri 810; Indiana 750; Illinois 700; Michigan 600; Wisconsin 575; Iowa 500; Tennessee 490; Virginia, 460; Texas 450; North Carolina 405; Minnesota 390; Georgia 340; West Virginia 335; Kansas, 320; running down from that to 3 for the District of Columbia. While Minnesota is fourteenth in the list, according to number, the capacity is beyond the capacity of any other State, owing to the larger size of the mills. The daily milling capacity of Minneapolis is above 47,000 barrels, if run up to the highest possible limit. This, however is impracticable, and during the last year the average production in this city was 67.8 per cent. of the total capacity. The average production of Duluth and Superior was 56.3 per cent. of the total capacity. The average production of St. Louis was 48.8 per cent.; of Buffalo 55.9; Milwaukee 60.9. The average daily capacity of Duluth and Superior during 1893 was rated at 12,361 barrels. The year began with less than that, but several mills were completed in West Superior during the season, and at the beginning of this year Superior had a capacity of 12,000 barrels daily and Duluth 6,300 barrels daily; St. Louis a daily capacity of 21,000 barrels; Buffalo 11,000; Milwaukee 10,200. Baltimore has some 3,300 barrels total capacity; Philadelphia about half as much; Detroit about 2,000; Chicago some 4,000; Kansas City above 2,000; Cincinnati about 2,000; Cleveland 4,000, and Indianapolis about 5,000 barrels. Minneapolis in 1892 manufactured 9,750,470 barrels of flour. In 1893 9,377,635 barrels. The product of Minneapolis exceeded in both these years, all the flour producing cities separately. The production of this city was greater than that of St. Louis, Baltimore, Philadelphia, Buffalo, Milwaukee, Toledo, Detroit, Chicago, Duluth and Superior, Kansas City, Cincinnati, Cleveland and Indianapolis combined, and they are the leading flour cities outside of Minneapolis. The production of flour, to capacity, in Minneapolis, in 1892, was 71.6 per cent. of capacity; St. Louis 51.1; Buffalo 64; Duluth and Superior, together, 51, and Milwaukee 71.3 per cent.

NOT ALWAYS THE CASE.

PERIODICALLY there floats through the technical press, says Power, an item to the effect that one-sixteenth of an inch of scale has been determined by accurate experiment to require 15 per cent. more fuel; three-sixteenths, 23 per cent. While this may be strictly true for the boiler experimented upon, it can not, in the nature of things, be of universal application nor an index of the loss which may be expected upon another boiler from a given thickness of scale. A boiler with a meager amount of heating surface would suffer seriously from an impairment of the efficiency of that surface by scale, while a boiler with ample surface would suffer comparatively little. The item evidently started from a formula based by Nystrom upon the alleged fact that saturated scale has about one-thirtieth the conductivity of iron plate, and giving the diminishing values quoted as the amounts of heat transmitted through a given amount of heating surface.

PRODUCTION OF WHEAT.

THE continued low price of wheat is a subject of much discussion in both the technical and general newspaper press. There are those who entertain the view that some day in the near or distant future we will experience a period when, at least, comparatively high prices will once more prevail. The MILLER has several times pointed out of late that the burden of evidence would seem to establish much more clearly, that a high-level of prices is something that we can hardly hope for unless by reason of an unusual and extraordinary phenomena. The Commercial, of Winnipeg, has discussed the question at some length, and holding to the view of the MILLER, gives a number of reasons, which seem to indicate that an era of prices on a permanently low level has set in. Our Manitoba cotemporary says: "In the first place we have to recognize the fact that nearly all staple commodities have reached a lower plane of values, with the prospect that prices will permanently remain lower than they were a few years ago, though there may be some reaction from the very bottom prices which now prevail. Most other commodities being lower, it is only reasonable to expect that wheat will remain lower, and indeed, the fact that other goods are lower in price, will make possible the profitable production of wheat at lower values than formerly ruled.

"The next thing we have to look at is the wide area of territory where wheat can be produced to advantage. Wheat is being harvested somewhere almost every month in the year, and new territories are constantly being opened up by the advance of civilization and progress of the world, which are adapted to the production of wheat. Only the other day, it was announced that a large area of country in Africa, hitherto inaccessible, had been discovered to be well adapted to wheat. The cultivation of wheat has become so general, that a short crop in one country will hardly now affect the supply of the world, and to materially advance prices, there would have to be a crop failure over a very large area. It is even doubtful if a sharp advance in prices by reason of a short crop would be beneficial to wheat growing countries, for it might result in such an expansion of the wheat area generally as would quickly lead to immense over production, to be followed by lower prices than have yet been experienced.

"The third factor we will consider as contributing to lower prices for wheat, is the cheapening of transportation. There has been a wonderful decline in the cost of transportation by water during recent years, which has led to increased competition. It was stated that a cargo of California wheat was sold at Liverpool a short time ago at a price which would aggregate less than the freight rate alone would have amounted to twelve years ago. Few people realize what a factor the reduction in the cost of transportation has been in reducing the prices of commodities. Prices have been reduced and equalized in different parts of the world by the cheapening of transportation. Remote regions are now brought into active competition with near by countries in importing markets, with little or no disadvantage in the cost of transportation."

Then giving to the subject a local application the Commercial adds: "There is a large area of Western Canada, which is admirably adapted to the cultivation of wheat. What seems to be the natural product of the country, and can be grown to better advantage than any other crop, prices being at all equal. The question is, will we be compelled to cease producing wheat, for which the country is peculiarly adapted? We think not. We are at a disadvantage with some competitors on account of our inland position, but we have other advantages which should enable this country to produce wheat in large quantities. While it is evident that our farmers must diversify their operations and go more into stock-raising, dairying, etc., than they have in the past, we must still endeavor to keep in the race in the production of wheat. Instead of giving up wheat, we must study how to make it profitable at the lower prices now ruling, and endeavor to remove every obstacle to profitable production. Already considerable progress has been made in this direction. Through the great cheapening of agricultural implements and other articles necessary to the farmer, which has taken place in Manitoba during recent

years, our farmers should be in a position to grow wheat very much more cheaply than they could a few years ago. Further reduction in the cost of growing wheat may be made by improved methods of agriculture. Customs taxation must be reduced. Manitoba, as an agricultural country, is in open competition with the world. Tariffs cannot do anything to protect our farmers and enable them to compete to better advantage with the world, but tariff taxation can do a great deal to handicap our farmers in this competition. Burdens of this nature must be removed. The cost of transportation must be reduced, and we believe will be very materially reduced. We have a northern and eastern water route, either of which are capable of great things for the country. The eastern water route is now of incalculable service, and is capable of further considerable improvement. Altogether, we have no reason to despair of being able to produce wheat at a profit, in competition with the world."

CURRICULUM OF GERMAN MILLING SCHOOL.

AS is well known there is in Chemnitz, Germany, what is called a mullerschule, or school for millers, being a branch of the State Polytechnic Institute, wherein the pupil is educated in technical science and the practical knowledge of milling and millwrighting. The course of study in this school is as follows:

FIRST TERM.

1. Milling in general (four hours). Practical part—the system of measures, weights, and standards in the other countries most important to the trade; estimates of price according to quality of grain; statistics of granaries and grain trade. Technical part (continued as mill-building in second term of No. 10)—systems of grinding, with their special arrangement of machinery and transportation; transporting, lifting, and weighing appliances of mills; effectiveness and expenditure of power of different milling apparatus; machines for cleaning the grain, etc.; fanning, hulling, and brush machines, etc.

2. History of milling products in nature (two hours). Treatment of the elements and chemical treatment most important to plant life; analysis of grains, microscopic examination of their structure; flour, dough-making, and baking processes; determination of gluten and flour inspection.

3. Mathematics and mechanics (eight hours). Logarithms; elements of plane trigonometry; theory of curves so far as necessary to understanding of mechanics; theory of equilibrium and motion of material points and of rigid bodies; frictional resistance; strength. (Treatment elementary and limited by the demand of the practical application.)

4. Physics (four hours). Theory of heat.

5. Machine theory. (Same as Werkmeisterschule, No. 9.)

6. Machine drawing (eight hours). Preparation of working drawing of simple transporting and milling machine parts.

7. Free-hand drawing (two hours).

8. German language (four hours). Exercise in preparation of business papers; technological descriptions, etc.; exercises in extempore speaking, with taking notes; most important sections of history of German literature.

9. Field and water surveying (four hours). Handling of the simplest surveying instruments for laying out mill pits, mill ponds, etc.; leveling water surveying through gauges, floats, etc.

SECOND TERM.

10. Mill-building (four hours). Pulverizing machines, cylinders, swing mills, mill stones; setting up, adjusting, and cutting millstones; grinding and rifling machines for cylinders; cylinder sieves, etc.; machines for cleaning the meal, mixing, and packing flour; transporting apparatus, with reference to the motor and grinding system.

11. Mechanic (four hours). Same as Werkmeisterschule, No. 15; also weirs and mill pits.

12. Machine theory (six hours). Continuation of No. 5; valves; shafts; toothed wheels; water wheels; turbines; steam boilers; steam engines.

13. Machine drawing (eight hours). Drawing from examples and plans of different milling machinery and tools; water wheels; plans of mill apparatus from drawings,

14. Free-hand drawing (two hours). Continuation of No. 7; making and shading drawings from plaster models.

15. Building (one hour). Window openings, stone ceilings, simple arches; chimneys, wood-jointing, sleepers, beams, etc., and their supports; roofs, with their supports; roof construction with truss and strut frames, etc.; stairs; building site; foundation.

16. Building drawings (one hour). Drawings of small buildings from given designs and original.

17. German language (two hours). Continuation of No. 8.

18. Business bookkeeping (two hours). Points most important to the students.

Students are also admitted to certain departments of the Werkmeisterschule.

THE ESSENCE OF MODERN TRADING.

ADAPTABILITY, says the Miller (London), is the essence of modern trading. Had not our millers adapted themselves to the altered condition of science, the fine flour which we use must have become the product of Hungarian or Minneapolis mills, and had not the difficulties raised by the free importation of various grades of American flour been grappled with there would be far fewer English mills now open than is to-day the case. But the farmer declines to adapt himself to his environment. He sows wheat for quantity when quality is his best chance for profit, he grows it on land which is too highly rented for a crop which gives at best four quarters at 26s. 6d. per quarter. The higher and more philosophical way of looking at the farmer's position would justify his tenacity. It is not to the national advantage that the farmer should be regarded as a trader pure and simple. Willingly or unwillingly he must also be regarded as insuring us a minimum of supplies in case of foreign complications. He has a function to the State to perform in raising a certain quantity of bread food. That is the view of the farmer which prevailed in ancient times, which the middle ages endorsed, and which is vigorously endorsed by all Continental nations and by the United States. Even the most advanced of English statesmen would hesitate to meet it with a clear denial. Yet it cannot be denied that had the English farmer shown since 1879 that adaptability to the circumstances of trade advantage which his friend and neighbor the English miller has known, the cultivation of wheat in the United Kingdom must needs have become extinct.

Thus it is that the end of one year and the beginning of another finds us confronted with varied but not uniformly unprofitable milling fortunes, with unvaried and unprosperous farming fortunes. As millers, we hope the English farmer will go on providing us with the soft and easy-working grain which tempers the steely wheat of Chili, the hard and ricey Indian, the varying qualities of different climes. But, as economists, we cannot honestly advise the agriculturist to go on doing anything of the kind. He is at present losing on every sack of English wheat that he brings to market, and there exists very little reason for price recovery in any future discernible from such vantage ground for outlook as the 1st of January, 1894, may afford.

TRICK OF A SAFETY VALVE.

AN engineer recently observed his steam gauge indicating a higher pressure than his safety valve spring was set for. He slackened the spring, but the gauge kept rising and the steam did not blow off. He slackened the spring further, still the steam did not blow. When the pressure rose to 200 pounds he became alarmed; and as he could not start the engine he started the injector and opened the water blow-off cock. The damper being closed, this had the effect to prevent further increase of pressure. On examining the safety valve it appeared that the brass seat of the valve was a bushing put into an iron casting, that it had become loose and that the steam had pressed it up against the valve. As the valve rose the seat followed it, and there could not have been a release of steam until the bushing was pushed out of its hole. Some serious accidents have occurred from this cause. It is not good engineering to so construct safety valves that it is possible for the valve-seat to become detached.



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—BY—

C. H. MORTIMER

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THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

CHANGE OF OWNERSHIP.

FOR some years I have been talking to readers of THE MILLER through these columns, but with this issue my connection with the journal ceases. Mr. C. H. Mortimer, the well-known publisher of the Canadian Architect and Builder and Canadian Electrical News has purchased the entire assets and good-will of the paper and with this issue assumes the duties of editor and publisher. That he is capable of maintaining THE MILLER in the front rank of Canadian trade journalism there is no room for doubt. I trust that not only will the patronage heretofore extended to me be continued to the present owner, but that the amount of advertisements and subscriptions will be supplemented. To the milling and grain trades my thanks are extended for favors in the past. In conclusion I would say: "Stick to your own trade paper and it will stick to you."

A. G. MORTIMER.

IN assuming control of THE CANADIAN MILLER, with the interests of which, as The Mechanical and Milling News, I was for several years intimately identified, it is a pleasure to me to know that I shall have the opportunity of renewing acquaintance with one of the greatest of Canadian industries and with valued friends of the past whose business interests are connected therewith. It is also my hope and desire that I may succeed in adding to the number of these old acquaintances and friends, many new ones, and that in the efforts which will be made to publish a journal that will be creditable in appearance and of interest and practical value to persons connected with the flour and grain interests of Canada, I shall be accorded the measure of encouragement and support which the merit of the publication shall deserve.

C. H. MORTIMER.

GROWING WHEAT RIVALS.

IN a letter of some length to the Globe, of recent date, Mr. James B. Campbell, of Montreal, discusses the question of tariffs in relation to the development of trade, and more especially in their relation to the cultivation of wheat and the finding of a market for this product. The information that the article furnishes touching the expansion of late years of the wheat fields of foreign countries will be of the most immediate concern to readers of the CANADIAN MILLER. Mr. Campbell's views on the tariff may be open to discussion, but the facts he has gathered regarding the strong position that India, and especially the Argentine republic, are assuming as wheat growing countries will pro-

vide food for thought for farmer, miller, and grain handler in this country. The development in wheat growing in Argentina is very remarkable, though as an English miller says elsewhere in these pages it may be that the best millers will want none of this wheat, even at 67 and 70 cents.

Only a few years ago the people of Argentina were importing wheat. In 1882, according to Mr. Campbell, she began exporting with an insignificant 62,000 bushels. In 1893 she exported 30,600,000. This year she promises 50,000,000 bushels.

With regard to the purchasing power of wheat and corn this correspondent says, the English sovereign is a star of the first magnitude. Gold is about 250 premium in Argentina. When the Argentine farmer sells his wheat, he sells it for paper money on an inflated basis, but this money pays his way in his own country, his transportation, taxes, buys his food, and last, but not least, pays his labor account. It is only when he invests in an imported article that he must pay out paper money on a gold basis.

"It is asserted," says Mr. Campbell, "that Argentina can sell wheat at a cent a pound in Liverpool and live. She is doing it at present at 67 cents per 60 pounds. I shrink from asserting that only 5 per cent. of the arable land of Argentina is under the plough, nevertheless it is said to be so. They have 750,000 square miles of land, irrespective of Chaco and Patagonia, and there is also Uruguay to be considered. Fifty million bushels is not a very large item in the world's supply of wheat, but these countries are developing, and the most serious part of the business is that their harvest comes on in December and January, and when they have a good crop the wheat will be pouring into Europe during the months of March, April and May, and taking the market for our spring shipments from the lake ports. The English merchants, if sure of Argentina, and watching the harvests of India and Egypt, which come on in March and April, will refuse to bid up for the American wheat, which has carried storage, insurance and interest charges throughout the winter at Chicago, Duluth and Port Arthur. England can always avail herself of the cheapest labor and transportation, and if we are to export we must sell on the same basis."

When we go away from the Argentine, which, as one of the newest wheat rivals, is commanding increased consideration just now, we learn that dams are to be built on the Nile, which are to add to Egypt a fertile belt equal to a fourth of the area of Europe. Wheat is to-day growing in the old world where it has not grown during the Christian era. The United States Consul recently reported to his government that the more settled condition of the country about Bagdad had given an impetus to the cultivation of wheat, and that "communications by means of lighters and steamers are good."

All these are conditions that give point and emphasis to those who tell us that the day of high prices for wheat has indeed found its resting place only in the gone past.

EDITORIAL NOTES.

DOMINION millers will regret to learn from the news columns of this issue of the MILLER of the destruction by fire of Barrett's flour mill and contents at Port Hope. Mr. H. Barrett is the capable vice-president of the Dominion Millers' Association.

REMARKING on the report that Montreal speculators lost \$10,000,000 during 1893 in the New York and Chicago markets, the Milling World curtly says: "Well they will get little or no sympathy. They had no business to speculate." This is cold comfort to the men who dropped the money, but we do not know but what it is all they deserve. The ruinous spirit of speculation that is rife to-day is no helper to legitimate grain-buying and we can hardly suppose that the miller sees any solace for the present depression in flour in the speculative habit. A danger indeed that the miller must avoid is that of becoming a speculator himself.

A WHEAT-GROWING country that is pushing ahead with considerable energy lately is Turkey-in-Asia. A late English consular report says: The fact that the districts are yearly becoming more settled causes more

land to be taken into cultivation. The year 1891, owing to the impetus given to the export of grain, has shown to cultivators the advantages to be gained by increased cultivation, and hence it may be safely surmised that the export of grain from Bussorah will in the near future make considerable progress. There are hundreds of square miles of land, both on the Tigres and Euphrates, which are capable of producing wheat, and which so far have not been cultivated. Communications by means of steamers and lighters are good between Bussorah and Bagdad. On the Euphrates, however, owing to natural causes, and also to the still unsettled state of the country communications are bad. Should the latter be rectified, there is no doubt but that the increase in the export of grain will be very large, and as a natural consequence the demand for European products will materially increase.

WITH the growth of many large milling concerns in different parts of the United States the question has been frequently raised, and discussed with a good deal of warmth on both sides, how far a development of trade in this direction is likely to effect the small millers of the country? It has been argued with much positiveness that as the trend of trade in almost every direction is towards centralization, so will it be with milling before long. The reply has been made with force, that the number of small mills is growing rather than declining throughout the country and these are paying their owners a fair profit, whilst it is notorious that some of the largest milling concerns have been unable to pay their shareholders any dividend worth naming. This is to be said that the flour mill is the pioneer manufacturing concern of new localities and that in this particular the small mill holds an advantage over the big concerns which will locate only, of course, in large centers. The greatest difficulty that the small miller, perhaps, has to contend against is competition in prices. We have not heard any serious complaint, so far, of trouble in this direction in our own country, unless we except a very bitter complaint, that comes from Moosomin, Man., where it is said the Ogilvie Company are crowding out some of the smaller millers by underselling, and some go so far as to call for legislation to prevent what is termed an altogether illegitimate use of organized capital. Just how much there is in this complaint it is perhaps hard to say, for it is to be remarked that the Ogilvie concerns have generally been given credit for generous and courteous treatment of rivals in the business.

A COMPLIMENT to the quality of Manitoba wheat is to be found in the efforts that North Dakota farmers have been making to secure this wheat for seed purposes. We have noted in our news columns that the application to Washington to permit of this wheat coming in free of duty has been refused. The Duluth papers are of the opinion that the privilege should be granted; that, "There is no question that the removal of the duty would stimulate the wheat trade of Duluth and it would at times give our millers the benefit of quality of wheat that they did not always conveniently get on this side of the border." Our contemporary then goes on to say that two railroads run from Duluth to Winnipeg now and the Canadian Pacific will soon have a line to the head of the lakes. All this would mean an expansion of trade that would be satisfactory to Duluth and which Manitobians would hardly likely dispute. Contrariwise, however, to this view is the opinion expressed by a prominent member of the Winnipeg grain trade, who says: "The surplus wheat from both countries, Canada and America, finds its market in England. The only time at which Manitoba would reap an advantage would be in case of a shortage of hard wheat in Minnesota and Dakota. But on the other hand the Manitoba farmer will lose the Ontario trade. At certain times, as now, the Ontario millers pay several cents above an export basis for Manitoba wheat for mixing purposes, but if the American people allowed our wheat to go in free we must take it for granted that the Canadian government would reciprocate. Ontario would then draw its supplies from the hard wheat of the States. As far as the Manitoba dealer is concerned, the carrying out of the idea would make no difference whatever."

AMERICAN FLOURS IN CANADA.

AT a time when millers are discussing tariff conditions, and the question is a practical one in legislation both in the United States and Canada, the following extracts from reports of consular agents in Canada giving figures and opinions concerning the matter at the leading centres of the Dominion will be found interesting:—

MANITOBA.—American flour is barred from this market by an import duty of 75 cents per barrel. Besides, the freight rates from American points make competition with local mills difficult, if not impossible. Good wheat can be had close at hand in abundance at first cost direct from the farmer. With a full interchange of flour between the United States and the territory embraced within this consulate, our American millers might at times sell here, but they could not secure a steady profitable market. This is a wheat-growing country, and large quantities are annually raised for home consumption and for export.

ST. JOHN, N. B.—The importation of wheat flour from the United States for the past three years ending June 30, has been as follows: 1891, 1,193 barrels; 1892, 818 barrels; 1893, 309 barrels. During those periods not a bushel of American wheat was entered at the port, and no wheat or wheat flour was imported from any other country.

ST. STEPHEN, N. B.—The importations of American wheat flour into this district during the year ending June 30, 1891, 1892, and 1893, were as follows:

Year.	Barrels.	Value.
1891.....	244	\$1,459
1892.....	127	763
1893.....	80	478

During the same period no American wheat was imported into this district, nor were there any importations of wheat flour from other countries.

HALIFAX, N. S.—The following is an official statement prepared by Mr. Thomas Cardwell, statistical clerk in the custom house at this port, of the importation of American wheat flour into Halifax for 1891, 1892, and 1893:

YEAR ENDING JUNE 30—	WHEAT FLOUR.		WHEAT.	
	Quantity.	Value.	Quantity.	Value.
	Barrels.		Bushels.	
1891.....	625	\$2,729	20	\$34
1892.....	2,948½	13,242	40	53
1893.....	14	58	10	13

NORTHERN NOVA SCOTIA.—The quantity of American wheat flour imported into this district in the year ending June 30, 1891, was sixty-eight barrels, fifty-eight of which were entered into Pictou customs district and sixteen in that of Arichat, Cape Breton. The number of barrels in the year ending June 30, 1892, was six, entered at Arichat. The same for 1893 was four barrels, also entered at Arichat. There was no American wheat imported into the district during the years above mentioned, nor were there for the same period any importations of wheat flour from other countries.

BELLEVEILLE, ONT.—I do not think that under present conditions the outlook for extending the market for American flour is at all promising; but it is the opinion of a majority of the larger dealers that were the same conditions existing as in and previous to 1865 our trade in flour with this district would be to a large extent regained, and in this opinion I concur.

CHATHAM, ONT.—No American wheat or flour can be sold here and pay the present duty imposed upon those articles, and none has been imported in years. All the flour used is made here from wheat grown in Western Ontario, with the exception of a very small amount made from wheat brought from the Canadian northwest. Of the total amount sold, 75 per cent. is made by the so-called "patent process." The facilities for shipping here are the best—either by one of three railroads or by steamer during navigation. The removal of the duty would admit a certain quantity of spring wheat or flour made from it, as the bakers generally prefer it; but the leading men in the milling business claim that the abolition of the United States duty would admit them to a proportionate share of American trade. They sell their best flour in carload lots at \$2.75 per barrel. Local retailers buy at \$3 and sell to consumers at \$3.50.

COLLINGWOOD, ONT.—No wheat or wheat flour was imported from the United States or elsewhere into this district during the years 1891, 1892, and 1893. The obstacles in the way of an extension of trade in American flour are the prevailing rate of duty here, the local

production, which somewhat exceeds the consumption, and the wheat and flour which are brought here from Manitoba and the Canadian northwest. There are no prospects for doing a more extensive business in American flour in this country so long as these conditions prevail.

HAMILTON, ONT.—The collector of customs at Hamilton has informed me that no wheat flour from the United States or from any other country was imported through his port of entry during the years ending June 30, 1891, and June 30, 1892, but that half a barrel of flour was imported from the United States during the year ending June 30, 1893, for the purpose of making certain special bread for the use of Hebrews in their religious observances. He has furthermore stated that one barrel of cracked wheat was imported from the United States especially, on private account, during the year ending June 30, 1891, and that six bushels of United States wheat were imported during that year and twenty-five bushels from the same country during the year ending June 30, 1893. These two lots of six bushels and of twenty-five bushels of wheat were imported, he believes, for use as seed. No wheat was imported from other countries through the port of Hamilton during the three years in question, nor was any foreign wheat flour or wheat imported during those years through the ports of entry of Berlin, Galt, Paris, or Brantford, Ont. with the exception of 950 barrels of flour imported from the United States through the port of Brantford during the year ending June 30, 1893. It appears, upon investigation, that this importation consisted of a lot of damaged flour purchased at a very low price for the purpose of manufacturing starch therefrom, and that its damaged condition and the low price at which it was bought admitted of its importation at a comparatively small cost to the importer, notwithstanding the high rate of duty on flour. The great and only serious obstacle in the way of the extension of trade in American flour in this district is the customs duty imposed by the Dominion of 75 cents per barrel on flour and 15 cents per bushel on wheat. The wholesale price in this market for Manitoba flour made from spring wheat and commonly termed here "strong flour" is from \$3.50 to \$3.80 per barrel. The wholesale price for flour from winter wheat is \$2.60 to \$2.75 per barrel. This flour is made from Ontario wheat. The latest quotations accessible here of the wholesale prices in the Chicago market are from \$3.80 to \$4.15 per barrel for flour from spring wheat and from \$3.25 to \$3.50 per barrel for flour from winter wheat. It will be observed that the above quotations indicate that the price of each of the two grades of flour in question is somewhat less at present in this consular district than at Chicago, but millers and consumers of flour here allege that the Manitoba spring wheat is equal in all respects to that of Minnesota, and that the flour from Ontario winter wheat is as good as American wheat flour. Furthermore, the payment of the duty imposed on American flour imported into Canada would add 75 cents per barrel to the price of the flour as quoted at Chicago when the same is received by an importer in Ontario. Under these circumstances it would seem that "the prospects for doing a more extensive business in American flour" in this section are not good.

KINGSTON, ONT.—From June 30, 1891, to the present time only one carload of American flour has been imported into this district; with that single exception, all flour used since that date has been from Canadian wheat ground in Canadian mills. The people are ready to eat American flour if it can be given to them better or cheaper than the Canadian article. Under present circumstances the outlook for placing American flour upon this market is not favorable.

OTTAWA, ONT.—Canada is essentially a wheat producing and exporting country, and the importations of American wheat and wheat flour are only nominal. During the fiscal year ending June 30, 1892, the last for which official figures are in print, Canada imported 66,113 bushels of wheat, of which 65,105 bushels came from the United States, and 36,559 barrels of flour wheat, of which 34,338 barrels came from the United States. During the same year Canada exported 8,714,154 bushels of domestic wheat, of which 1,486,881 bushels were sent to the United States, and 380,996 barrels of domestic wheat flour, of which 3,998 were for the United States.

The obstacles in the way of extending the trade in the American wheat and flour in Canada are mainly two-fold—the import duty and the fact that Canada can and does produce these products quite as cheaply as the United States. For these reasons, and especially the latter, the use of American wheat flour can only be local and occasional.

SARNIA, ONT.—This is an agricultural district. They export from here large quantities of wheat to the United States so it would be difficult to extend the market for American wheat flour here. There was no American wheat flour imported into this district in the years ending June 30 1891, 1892, or 1893, and no American wheat during the same period. There was none from other countries during the above years.

MONTREAL, QUE.—Wheat flour is generally used, and in the country districts its use is probably more universal than even in the United States, there being very little bread made from flour or meal of other cereals. The quality of flour which seems to be in greater demand is stated to be what is termed "Strong Baker's," although the "Patents" and "Straight Roller" are largely used. I am informed that the greatest proportion of all manufactured for consumption here is ground from hard Manitoba wheat, while the quantity of Ontario fall-wheat flour consumed is very small. A Chicago firm formerly doing some business in Canada stated that their most popular selling grade in this country, especially in Toronto, Montreal, and Quebec, was what they termed a spring wheat bakers' flour, which was "used extensively in what is called bakers' mixture." The quality of wheat and flour imported from the United States into the port of Montreal for the past three years is given in the following table, and also the amount of the same imported for consumption:

YEAR ENDING JUNE 30—	TOTAL IMPORTS		FOR CONSUMPTION	
	Wheat.	Flour.	Wheat.	Flour.
	Bushels.	Barrels.	Bushels.	Barrels.
1891.....	2,453,647	15,272	40,561	9,459
1892.....	4,936,479	19,291	42,094	6,512
1893.....	4,110,229	21,096	1,825	4,005

Prior to the year 1890 the import duty on wheat was fifteen cents per bushel and fifty cents per barrel on flour, and even with this restriction a small trade in flour for consumption was possible; but in March of that year the duty was increased to seventy-five cents per barrel, and that increase seemed to have the effect of closing this market to the United States. The Chicago firm already referred to inform me that on the basis of fifty cents duty per barrel they were able to compete, to some extent, with Canadian millers throughout Ontario, Quebec, and the lower provinces, and, although the margin was small, they were able to do business, working closely; but after the increase to 75 cents they were entirely shut out. The imports from the United States for consumption at this port dropped from 81,000 barrels in 1889 to 4,000 barrels in 1893, as will be seen in the following statement of imports for each of the past five years ending June 30:

	Barrels.
1889.....	80,997
1890.....	31,219
1891.....	9,460
1892.....	6,513
1893.....	4,006

There is no wheat or flour imported from any other country, and, as shown in this table, but very little of that from the United States is for consumption. With respect to the obstacles to extension of the trade in wheat and flour and the prospect for doing a more extensive business, it may be stated that the chief and probably sufficient obstacles to extension are, first, the quantity of wheat grown within the limits of the Dominion, more especially in Manitoba and the Northwest and, second, the import duty. The first obstacle is not insurmountable, and, although competition might be sharp, it could be met with a fair degree of success; but the second is substantially prohibitive, and places this market entirely beyond the reach of dealers in the United States. The receipts of flour during past six years were as follows:

Years.	Total Receipts.	From the U. S.	From Canada.
	Barrels.	Barrels.	Barrels.
1888.....	933,121	66,223	866,898
1889.....	668,876	59,481	909,395
1890.....	978,843	28,870	949,973
1891.....	1,153,421	18,062	1,135,359
1892.....	980,888	10,285	970,603
1893.....	795,286	16,781	.....

*Six months.

SHERBROOKE, QUE.—There were 152 barrels of American flour imported into this district in the year ending June, 1891; 30 barrels in the year ending June, 1892, and 311 barrels in the year ending June, 1893. There was no American wheat imported in the district during 1891, 1892, and 1893. There was no wheat flour, nor any wheat, imported into this district from other countries during the same period. The only obstacle that I can see to the extension of trade in American flour is the duty of 75 cents per barrel that the Canadian Government imposes upon American flour. If that duty were reduced there is no doubt but there would be a large increase of trade in American flour in this district. I have talked upon the subject to different flour merchants here, and they all say that they would like to handle American flour if they could buy it more cheaply than, or even as cheaply as, Canadian flour.

CURRENT COMMENT.

GEORGE BULL'S grist mill at St. Albert, N.W.T., was destroyed by fire a few days ago. The mill contained about 5,000 bushels of wheat and a quantity of flour. The loss will amount to about \$10,000 with no insurance.

THE agrarians of Italy have issued a call for congress to meet on April 15th with a view to influencing the debate in the chamber of deputies in behalf of an increase of the duty on wheat. A number of the various municipal councils, chamber of commerce and Agrarian societies throughout Italy have petitioned the chamber to make this increase, and the matter will probably be taken up within the next month.

OF the immense resources and commercial possibilities of India there has never been any doubt in the minds of those, who have made a study of conditions in that great empire. What seemed to be most needed is an opening out of the country by means of the iron horse, and thus give increased facilities of communication and transport. The Indian Commerce discussing the question of railways in that country sees great encouragement for development in that direction. The Director-General of Indian Railways, in his report for the year ended March last, is able to record a total of 18,042 miles open, which contrasts with 17,564 miles in 1892, and 15,243 in 1889. In the last five years no additions have been made to the mileage worked by guaranteed companies, not to "foreign" lines, but 1,774 miles have been added to State lines worked by companies, 312 miles to State lines worked by the State, 180 miles to assisted companies' lines, 120 miles to lines owned by native States and worked by companies, 108 miles to lines owned by native States and worked by State railway agency, and 335 miles to lines owned and worked by native States. This is progress in the right direction, but it should be quickened. There is, of course, the exchange difficulty to be grappled with, and this involved a loss which is estimated at Rs. 1,710,800 for the last calendar year. But one-third of that sum can be written off the lines which were avowedly constructed for military purposes, and not expected to pay their way; and those who look forward to commercial lines being remunerative have none the worse of the argument, even when regard is had to past experience. Already one of the greatest resources of India is wheat; to the extent, in fact, that it is already becoming a formidable competitor in European markets with the wheat of this continent.

A USEFUL RECIPE.

A FIREPROOF and waterproof substitute for paint, for use in boiler and engine rooms, consists of six quarts of freshly slacked lime, well sifted, to which is added one quart of rock salt and a gallon of water, the mixture being then well boiled and skimmed clean. To five gallons of this mixture are added a pound of alum, half a pound of copperas (stirred in slowly), three-quarters of a pound of potash, and four quarts of fine sand or hardwood ashes, well sifted. To this may be added any coloring material desired. It is said to be as durable as slate, and to be especially applicable to brickwork and similar surfaces.

EXPERIENCE in electrical welding shows that the metal is strengthened at the point of welding.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

DEFECTIVE EXPORT METHODS.

THE opinion is expressed by Mr. C. A. Pillsbury, the big Minneapolis miller, that the foreign flour trade is now worked by American millers for all there is in it, and that it may probably be regarded as having reached its maximum. This is high authority, though the statement will be read with surprise by many millers. Mr. Wilder Grahame commenting on Mr. Pillsbury's view in an article in *Milling*, of Chicago, is inclined to hold to the same opinion. Mr. Grahame thinks, however, that the greater mistake of the miller has been in lax efforts to retain the foreign trade already secured and it is here the depreciation in this trade is to be most felt. Entering somewhat into particulars he states, to quote a vulgarism, that the American miller thinks himself so smart, that he knows better what the foreign flour handler wants than he knows himself.

The system of packing for foreign markets is believed to leave much to be desired. There is a difference in putting up flour for transportation by railroads with few handlings necessary, and quite another affair to successfully ship where about all the destroying elements of man and nature play a part.

"One of the general complaints from foreign countries," says this writer, "comes from the use of the destroying hooks in loading and unloading goods at the docks. Even ropes cause more or less damage. Then, too, the flour once stored is liable to lie side by side with barrels of turpentine or petroleum. Any one at all familiar with the ocean service will appreciate the damaging effects of hot, damp, saline-charged air with which a ship's hold is burdened. Add to this the odor arising from various heated and ill-smelling articles of commerce and the desirability of an odor-proof covering will be seen.

"It is not a settled conclusion that the cargo, at its destination, will be unloaded under cover or pleasant weather. In some parts it must lie unsheltered, perhaps in the midst of heavy rains, until claimed by the purchaser or shipper's agent.

"If the flour is consigned to some merchant of the receiving port or of some town having direct connections therewith by rail, perhaps its adventures are about over; in the latter case, however, the chances of a ride across the country in an open flat car through the prevailing weather are pretty fair. But if intended for some interior mining camp, new possibilities await it. First of all, if it must, as is usually the case in tropical countries be packed through forests and over mountains on mules or donkeys, the packages must be of convenient size for handling; as small as forty pounds being required for some trades. If the receiving merchant has to repack to make it conform to these conditions, he is not particularly prejudiced in favor of the original shipper. If it is conveyed in the original package it must be able to withstand the attacks of the elements, insects, and the half-savage muleteer. Some of the latter when entering camp allow the package to drop from their steeds and remain whenever chance directs, be that in a water hole or bed of rocks. During the day the route perhaps will lead through swamps and dense tropical jungles, where thorns abound, and the sun's rays never penetrate: where there is a perpetual reign of dew and moisture."

There is much that is practical and sensible in these suggestions. Foreign trade cannot be successfully developed if the conditions and requirements of trade with these places are not studied. Canadian millers have had experience in this matter in shipments to the West Indies. We were disposed for a time, and a rather long time, to send our flours to the Indies, packed as though they had not to go beyond the limits of our own country. Trade was being lost to Canada and going elsewhere, where the requirements of these countries were understood. The Dominion Millers' Association, through its ever-watchful secretary Mr. Watts, went careful into the matter, and thanks to this enquiry and the publicity which the MILLER was able to give to the matter, things were mended, and Canadian millers learned how to secure and hold a share of the trade of the Indies.

Millers are interested in foreign trade in other points and how far they may be wanting in some or all of the particulars stated by Mr. Grahame, it will be for them to learn, and act accordingly.

A WAY OUT OF THE TROUBLE.

A recent inquiry, as to the extent to which wheat in the province was being fed to cattle, the results being published in these columns a short time ago, elicited the information that much more wheat had been chopped up for feed this year than in previous years; and from inquiry we have been able to make of our readers from time to time, we are led to believe that the practice is growing. Now it seems an anomalous position to be forced into for millers to use their mills to grind grain to be fed to hogs in place of putting the mill to its legitimate use grinding grain for flour, to be fed to human beings. A Minnesota miller has been writing to the *North Western Miller* on this question. [There the practice of feeding wheat to cattle is just as common, and perhaps more so, than it is here. This writer thinks there is a happy medium between the two extremes. He argues that instead of selling flour at such prices as foreign importers choose to pay, that a home demand be created for all our mill products below patent, making us entirely independent of the export trade on lower grades. Feeding wheat, entire, he says, is reckless extravagance. The suggestion is that the miller will receive the farmers' wheat, take out the patent flour and return to the farmer all below that grade and thus be obliged to find a market only for the best flour. In other words the force of the suggestion is to sell the manufactured product, instead of the raw material; feed the more useless parts of wheat to the cattle, let the better be made into flour and have the country become exporters of the manufactured article in place of the raw material. With the facilities of milling in this country, even allowing for the improvements that have been made in milling methods in Great Britain, we ought still to have a long advantage over them when it comes to making flour. We believe the matter must occur to Canadian millers in this light.

A REMARKABLE DAM.

ONE of the most remarkable dams in the world for height and construction is that by which the Vyrnwy river, Northern Wales, is enabled to supply water to the city of Liverpool, some seventy miles distant. In building this dam a great trench was excavated across the valley for a length of 1,100 feet, a width of 120 and a maximum depth of sixty. The masonry was started in this trench; it consists of immense irregular blocks of slate, wedged together and thoroughly bedded in Portland cement mortar, the faces being formed of cut stone block, fitted together with great care, the greatest height of the dam being 161 feet. Its most remarkable feature is the lack of any channel to carry off floods, the surplus in the lake flowing down the front of the dam covers an area four and three-fourth miles long, from one quarter to five-eighths of a mile wide and holds largely over 12,000,000 gallons. The aqueduct, leading from the intake tower to the distributing reservoir, about two miles from the city, is sixty-eight miles long, and consists principally of a large cast iron pipe line from thirty-nine to forty-two inches in diameter. There are a number of reservoirs and tanks along the line, and at one place is a great filtering plant.



Office of the CANADIAN MILLER,
March 20, 1894.

THE GENERAL SURVEY.

ONE may almost say of the wheat market, that it is a case of telling over and over again the old old story of no improvement. Grain men and millers have been listening to this story from month to month, hoping that each month might represent a turning in the lane, but it seems not to be. The information that comes from every intelligent source points clearly to the fact that continued low prices of wheat will be the order of the day. In other columns of the MILLER we have discussed particular features of this question, and it is not necessary to go over the ground again. One word is suffice, that the rapid, and in some respects, extensive opening of new fields for wheat growing shows that the whole basis of calculation, as to the possibilities of wheat prices, must be changed in the future. Since our last writing Chicago wheat has dropped as low as 59c, and the lowest quotation ever known in Liverpool, namely, 60c. has been reached. Compared with prices 12 months ago, to-day's figures are 21c lower, they are 34c less than two years ago, and if we were to take prices of February 1891 there is a difference of 39c.

These conditions stand out in striking contrast with the very positive declarations made a year and two years ago, that wheat was becoming so scarce, or rather that the consumption of this commodity was growing to that extent, that it only meant a few years at the most before the American republic would become an importer in place of, as to-day, an exporter of wheat. But matters do not look this way just now.

The American Agriculturalist, a journal that has given a good deal of careful study to the subject of wheat growing, has lately compiled a table in millions of bushels, that shows the ratio as follows since 1871:—

ANNUAL WHEAT EXPORTS.

Fiscal year.	U. S.	India.	Russia.	Total.
1871-75, average.....	63	2	55	120
1876-80, average.....	100	7	70	186
1880-85, average.....	140	29	63	232
1886-90, average.....	113	33	91	237
1891.....	106	27	104	237
1892.....	226	58	51	335
1893.....	192	28	84	304

Fiscal years end June 30, March 31, January 12.

According to these figures the exports for the ten years from 1880 to 1890 would average 235,000,000 bushels a year. The same authority furnishes also the following table:

IMPORT AND SURPLUS WHEAT COUNTRIES.

(In millions of bushels.)

Importing countries.	Net Imports.	Export countries.	Net Exports.
Belgium.....	19.2	Austria and Hungary.....	5.8
France.....	37.4	Bulgaria.....	5.7
Germany.....	18.8	Roumania.....	19.2
Greece.....	8.9	Russia.....	83.2
Italy.....	19.9	Servia.....	2.2
Norway and Sweden.....	1.9	India.....	30.9
Netherlands.....	8.6	United States.....	83.3
Portugal.....	3.7	Argentine Republic.....	3.7
Spain.....	6.1	Canada.....	2.4
Switzerland.....	10.9	Chili.....	3.9
United Kingdom.....	105.5	Australasia.....	8.2
Total.....	240.9	Total.....	248.7

This table places England as a customer for wheat at about 43 per cent. of the annual commercial supply. The United States, France, Germany, Italy and Belgium being the chief consumers of the remainder.

So it is, that all interested in the sale and consumption of wheat for commercial purposes, have presented to them in present conditions economical problems that will call for their best thought and consideration.

As far as local conditions are concerned some few sensations have occurred from day to day, or at longer intervals, as weather conditions have changed or statistical calculations of a semi-official character have been made public.

A recent statistical return of the United States department of agriculture indicates that a very considerable portion of the wheat now in farmers' hands comes from the crops of 1891 and 1892. The indicated stock of wheat in farmers' hands is 144,060,300 bushels. This is nearly 21,000,000 bushels less than the estimate for March 1st last year, and nearly 20,000,000 less than the average of the past eight years. The crops in producers' hands, as estimated, aggregates 589,000,000, or 36.4 per cent. of the crops of 1893. The official and commercial estimates of the world's wheat crop for 1893, make it 32,000,000 bushels less than last year. The final estimates will probably still further reduce the total for 1893, as the preliminary estimates for Russia and Germany are generally reduced by the final estimates.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—No change in the local markets. Red and white selling in limited quantity at 57c.; spring 59c. to 60c.; red winter, 57c. to 58c.; goose, 57c. to 58c.; No. 2, hard, 73c.; No. 2, hard, 71c. Montreal: No. 2, hard, Manitoba, 76c. to 77c.; No. 2, hard, Manitoba, 74c. to 75c. Chicago: April, 59½c.; May, 60½c.; July, 62c.; September, 63½c. Duluth: No. 1, hard, 62c. for cash; No. 1, Northern, 60½c. cash; No. 1, hard, 62½c. for May; No. 1, Northern, 61½c. for May; No. 1, hard, 64½c. for July; No. 1, Northern, 63c. for July. St. Louis: 55½c. for cash; 55½c. for April; 57¼c. for May; 58¾c. to 58¾c. for July. Detroit: 58½c. for cash; red 58½c. for cash; 59½c. for May; 61¼c. for July.

BARLEY—Toronto—The market is quiet. No. 1 is quoted at 41½c. to 42 at interior points, and at 44c. to 44½c. at water points. A Buffalo despatch says of American markets: The visible supply of barley at all principal points of accumulation is but 636,000 bushels as against 1,116,000 bushels at the corresponding date last year. There is 139,000 bushels in store here and over 200,000 bushels on the way from Chicago, and the entire amount has been either sold or will be shipped out on arrival. The receipts, however, will supply immediate needs of some malsters who are now on short supplies, but there is a fair enquiry here for barley at about the following quotations: Choice western, 67c. to 68c.; fair to good, 60c. to 64c.; common, 57 to 59c.; state, 68c. to 73c.

OATS—Toronto—Fair sales are being made. White quoted at 34c., and mixed at 33c. Buffalo: Offerings light. No. 1, white 38½c.; No. 2, white 38c.; No. 2, mixed 36c.

PEAS—Toronto—Somewhat easier. No. 2 at about 55c.

RYE—Toronto—A fair call. Sales made at 47c.

BUCKWHEAT—Toronto—Very little activity. Car lots east quoted at 37c., and round lots at 39c.

THE FLOUR MARKET.

TRADE in flour keeps dull. There is a fair local trade doing, but little call for flour for export. Bran and shorts, however, are in good demand, and at leading points, noticeably Montreal a few days ago, a strong upward tendency is shown. A Liverpool despatch of the 14th inst. states, that quotations are stationary, prices favoring buyers. Of Minneapolis markets the Northwestern Miller reports, the demand for flour to be slow. The export part was of about the usual proportions. The bakers' grade is usually sold abroad and also some patent right along. "Our people complain that Duluth millers have been offering flour for lake shipment at cut prices, and, in order to protect their regular trade, Minneapolis firms have had to meet this competition to a greater or less extent. The Duluth mills are represented to be also selling flour very low on the other side of the water, prices being seriously affected thereby. East-bound all-rail rates are badly demoralized, and it is a question if the difference in favor of lake transportation is not being largely discounted. Red dog is slow of sale, and millers are disposed to run it into their shorts pile."

PRICES OF FLOUR AND MEALS.

TORONTO.—Car prices: (Toronto freights) — Manitoba patents, \$3.70 to \$3.75; Manitoba strong bakers, \$3.45 to \$3.50; Ontario patents, \$2.90 to \$3; sraight roller, \$2.55 to \$2.70; extras, \$2.35 to \$2.40; low grades, per bag, 85c. to \$1. Bran—\$15.50. Shorts—\$16.50. The weekly Bulletin, of the Dominion Millers' Association, of the 19th inst., says of Ontario flour markets: Sales of straight roller, \$2.65 to \$2.70, and \$2.75, and 90% patent \$2.75, \$2.80 and \$2.85, f.o.b. for Lower Provinces. Bran \$13.50 and \$14.00, and shorts \$15.00 and \$16.00 f.o.b. middle freights. Export sales of straight roller reported at \$2.76½.

MONTREAL.—Winter wheat, \$3.50 to \$3.60; Manitoba patents, best brands, \$3.90 to \$3.70; straight rollers, \$3 to \$3.10; extra, \$2.76 to \$2.90; superfine, \$2.50 to \$2.65; Manitoba strong bakers, \$3.35 to \$3.40; Manitoba strong bakers, best brands, \$3.50.

CANADA'S NEW SHIPPING PORT.

THE business men of St. John, N. B., are putting forth very intelligent efforts to make known to ship owners and shippers of produce in the Dominion the capabilities of that port for export and import trade. From special information supplied by the Board of Trade of St. John, we learn:

The only Atlantic deep water terminus of the Canadian Pacific railway owned by it, is now at St. John, 481 miles from Montreal, and running on its own rails 3600 miles from Victoria, British Columbia. Freight can be discharged into vessels from cars on both sides of the harbor. The International railway has two deep termini here, receiving and delivering freight by cars and from and to vessels at the wharves along the harbor front, thus saving transfer and cartage charges.

The Canadian Pacific Railway Co., assisted by the city and the provincial government, has recently completed a first class grain elevator, fitted with all the latest improved machinery for hoisting, weighing and shipping, and is now ready to receive and ship grain, the size and capacity of which is a total storage room of 301,716 bushels, and can deliver 15,000 bushels per hour. The average receiving capacity of elevator is about 53,000 bushels per day.

There is now a well managed and very successful line of passenger and freight steamers, whose capacity is from 10,000 to 13,000 barrels each, carrying goods and passengers from China, Japan and the western provinces of Canada, running from St. John to the West Indies, carrying the West India mails under contract with the Dominion Government, calling at Bermuda, St. Thomas, St. Croix, St. Kitts, Antigua, Montserrat, Dominica, Martinique, St. Lucia, Barbadoes, Trinidad and Demerara, and leaving St. John every 28 days and returning to St. John via the same ports.

There is also a regular and satisfactory line of steamers (the Furness line) running between St. John and London, G. B., also under contract with the Dominion government which leaves each place simultaneously about every sixteen days. There are several lines or schooners running to all ports in the Bay of Fundy, which can deliver flour and other produce on through bills of lading at a lower rate via St. John than by way of Boston, New York and Portland.

Vessels of all sizes (steamers and sailing vessels) are open for charter at St. John at all seasons and at lowest rates. Atlantic insurance on vessels and all kinds of merchandise can be effected in St. John with reliable companies at the same (and occasionally at less) rates of premium as from New York, Boston, Portland or Halifax. Vessels can always depend upon being able to fill up with deals, timber and other freight to close out part grain cargoes at all seasons of the year. Steamers can be supplied promptly with first class steam coal at reasonable prices. Vessels of any size can be loaded and discharged very expeditiously at St. John.

There are no worms in the harbor of St. John, consequently vessels can lay in safety any length of time afloat, free from these pests; the large rise and fall of tide giving peculiar facility for the repair and reclassing of vessels. Vessels bound to St. John can always find first class pilots on the lookout 80 or 100 miles at sea.

The coasts of both sides of the Bay of Fundy from its mouth to St. John are plentifully supplied with light-houses, fog whistles and automatic buoys, by which the greatest safety is secured. The registered tonnage at St. John amounts now to 560 vessels 155,221 tons.

St. John is the distributing centre for a large number of trunk and branch lines of railway, and of steamboat lines, in New Brunswick, Nova Scotia, Quebec, Ontario and the northern part of the State of Maine. The board of trade can point with much satisfaction to the very exceptionally low averages of losses on vessels arriving at and departing from the Port of St. John during a period of ten years as made up by the entry and clearing department of the custom house, viz.

- 1st. The percentage of loss of tonnage of steamers as compared with total tonnage of steam vessels, entered and cleared is..... .08 of 1 p. c.
- 2nd. The percentage of loss of tonnage of sailing vessels as compared with the total amount of sailing vessels entered and cleared is..... .41 of 1 p. c.
- 3rd. The percentage of loss of cargoes of steam vessels as compared with the total amount of imports and exports is .002 of 1 p. c.
- 4th. The percentage of loss of cargoes of sailing vessels as compared with the total amount of imports and exports is .05 of 1 p. c.
- 5th. The percentage of loss of tonnage of both steam and sailing vessels as compared with the total tonnage entered and cleared is..... .26 of 1 p. c.

The arrivals at the port of St. John during the past seven years of sailing vessels and steamers amounted to 16,976 vessels of 4,447,009 tons, or a yearly average of 2,425 vessels of 639,858 tons. The clearances during the past seven years were 17,632 vessels of 4,627,088, or a yearly average of 2,519 vessels of 661,011.



A FEW days ago I had the pleasure of meeting and chatting with Mr. Howson, of Howson Bros., millers, Teeswater, and though a good many complaints are made of millers trade being slow, Mr. Howson tells me that they have done a good business in the past year. Of course he admits prices are low, and yet by careful management and push, he finds there is some profit in flour milling in Ontario. I asked him if he thought much wheat was being chopped up for farmers and he says considerable has been going that way. Farmers simply take the ground that the wheat nets them a better price chopped and fed to cattle than sold at market prices as they have ruled for some time past in his locality. Mr. Howson says there is very little wheat in farmers' hands.

* * * *

One of the veterans of the milling trade in Canada, and there are none more highly respected, is Mr. James Goldie, of Guelph. I exchanged a few words with him a fortnight ago. He is as perfectly keen to business considerations to-day, as years ago, when a much younger man he planted himself as a miller in the Royal city. The Goldies are large millers and to make milling with their great capacity pay, they must find an export field for their product. Because the export fields have been so depressed for the past year is an explanation, no doubt, of Mr. Goldie's remark that milling has not been any too profitable for a year back. Prices, he says, are simply demoralizing and the trade in export localities continues dull. A good deal of wheat in his locality is being chopped up for feed.

* * * *

Mr. Angus McKay, manager of the experimental farm, at Indian Head, N. W. T., has been visiting Ottawa on business connected with the proposed distribution of seed grain among Territorial farmers. Speaking to an interviewer of the shortage of seed grain he said: "It will take 50,000 bushels of wheat and 40,000 bushels of oats to supply the demand. This grain the Dominion government is now buying from well-to-do farmers in the Territories and Manitoba. About 15,000 bushels of the wheat will be purchased in Manitoba and a greater part of the balance from farmers near Indian Head. The grain is not given to the farmers as a present but sold at cost on a year's time, without interest, the government taking mortgages on the land." "Is this scarcity of seed grain general?" "No, indeed! The shortage is confined to three districts, the south-eastern part of Assiniboia, and the district adjacent to Regina and Moose Jaw." "How were these districts affected?" "They were visited by the 'chinook' and one particular day which will pass into history as the 'hot Sunday' did much damage to the grain." "Was the wheat crop totally destroyed in these districts?" "No, not by any means." "Don't you think there are good many asking for grain who could get all the seed they wanted without government aid?" "Certainly there are. The way of it is that one man who really needs seed grain asks for it, and then everybody in the neighborhood joins in the chorus. Yes, there is no doubt but that a large percentage of those who are getting seed grain from the government are simply taking advantage of the reasonable rates held forth." "Are the prospects good for a successful year in general through out the Territories?" "They were never better. The majority of the farmers are prosperous, and there is a good tide of immigration setting in. The ground is now nearly ready to seed, although it is too early to sow."

* * * *

A Peterboro grain dealer in looking over his correspondence the other day found telegraphic orders for 13,000 bushels of wheat for which \$2.50 per bushel was paid. The telegram was dated 1865, the time the American war was coming to a close.

THROTTLING vs. AUTOMATIC CUT-OFF ENGINES.

UPON this question the American Machinist in a recent issue says: There can be but little doubt, we think, that in some instances the throttling engine, with fixed cut-off, will equal in all respects, the automatic cut-off, and we believe it is possible to conceive of an engine being operated under such conditions that the former would show slight superiority. But in the great majority of purposes for which steam engines are employed it seems that the reverse must be true.

The great point of superiority of the automatic cut-off principle comes from the fact that most steam engines are subjected to variable loads, and quite generally some fluctuation in steam pressure. If this was not so then a properly designed throttling engine would be unobjectionable. For, of course, there is a point of cut-off for any engine that is the most economical, and a cut-off can be fixed for that point that shall, at least, be as good in all respects as that under the control of the governor. But because there is such a point of cut-off it does not follow that it is best to fix it, and reduce the pressure as by throttling for lesser loads. This economical point of cut-off varies with the steam pressure, and the automatic cut-off governor so varies it, which is right in principle. That is, if a cut-off at one-quarter stroke is the best for a given pressure, if the pressure is somewhat higher than that, it is better to take advantage of that high pressure by cutting off earlier than to reduce the pressure by throttling or otherwise. This is very near, but probably a universal fact. For example, with the point of cut-off correct for a given pressure it is possible—we think probable—that a little, not much, throttling may be better than a change to earlier cut-off. And in case of very materially higher pressure considerable throttling may be advisable. This would depend upon the quality of steam, and upon other circumstances, perhaps; at any rate it is to be shown that there is enough in it to afford a margin for the economical use of the throttling governor, except in selected instances.

The reaction in favor of throttling is not likely to be violent, but it is interesting. Engineers who set out to-day to improve the throttling engine have to aid them a good deal of general information that was not on hand at the time the automatic cut off engine made its appearance. Should serious effort be made to bring the throttling engine into competition with the automatic cut-off the attempt will be on quite different grounds from what it would have been made on twenty years ago, and it would not be safe to predict the outcome. It is possible only to fall back on the argument—which does not amount to much—that it cannot be seen how the effort can be successful, and await results.

WHY STEAM-BOILERS EXPLODE.

WHY do steam boilers explode? They do explode and lives are lost and property destroyed, and there is a cause for the trouble in every case. In a large number of such instances it is safe to say the trouble would not have occurred if those in charge had given heed promptly to some trifling defect at the proper time. It is the old story of the stitch in time and when the stitch is not made the rent enlarges, and in a steam boiler a rent is a serious affair. Some statistics have come to us from the Hartford Steam Boiler Inspection Company, which give much needed emphases to the moral we have here drawn. We are told that since the company began business they made 796,725 visits of inspection, inspected 1,580,060 steam boilers, made 608,786 complete internal inspections, tested 102,195 boilers by hydrostatic pressure, found 1,206,309 defects, of which 154,749 were dangerous, and condemned 8,406 boilers. Concerning their work in November, 1893, they say: "During this month our inspectors made 6,745 inspection trips, visited 14,706 boilers, inspected 5,241 both internally and externally, and subjected 537 to hydrostatic pressure. The whole number of defects reported reached 10,471, of which 1,058 were considered dangerous; 27 boilers were regarded unsafe for further use." Of their work in December, 1893, they say: "During this month our inspectors made 7,642 inspection trips, visited 15,971 boilers, inspected 6,647 both internally and externally, and subjected 574 to hydrostatic pressure. The whole number of defects reported reached 12,335, of

which 1,385 were considered dangerous; 83 boilers were regarded unsafe for further use." The summary for those two months is as follows:

Nature of Defects.	November.		December.	
	Whole Number.	Dangerous.	Whole Number.	Dangerous.
Cases of deposit of sediment	810	39	1,127	71
Cases of incrustation and scale	1,591	65	2,266	125
Cases of internal grooving	87	7	179	18
Cases of internal corrosion	523	30	776	40
Cases of external corrosion	654	44	887	45
Broken and loose braces and stays	161	39	276	89
Settings defective	229	25	291	46
Furnaces out of shape	361	17	410	17
Fractured plates	345	67	430	71
Burned plates	227	26	320	33
Blistered plates	276	12	338	25
Cases of defective riveting	1,282	113	1,149	80
Defective heads	93	20	165	53
Serious leakage around tube ends	2,365	322	1,845	346
Serious leakage at seams	359	29	550	62
Defective water-gages	331	80	315	76
Defective blow-offs	115	42	104	44
Cases of deficiency of water	11	6	15	11
Safety-valves overloaded	52	11	97	45
Safety-valves defective in construction	80	23	96	26
Pressure-gages defective	471	38	601	57
Boilers without pressure-gages	3	3	3	3
Unclassified defects	45	0	35	2
Total	10,471	1,058	12,335	1,385

OPINION ON ARGENTINE WHEAT.

AN element of concern in wheat raising in this continent has been the reported figure that the Argentine republic was likely to play in the raising of wheat, the larger part of which would reach the United Kingdom and come into competition with the wheat of this country. Added to the cheap prices at which wheat is being laid down from India the case has sometimes looked serious for wheat-growers here. One miller signing himself "Verax," writing in *Milling*, of Liverpool, Eng., does not see any cause for alarm, not at least so soon as millers get to know the kind of wheat raised in the Argentine. This miller very frankly writes: "I am greatly exercised in my mind concerning the big efforts which are being made to boom the wheat of Argentine on to the English market. I doubt whether south-country millers will take a large dose or be caught napping. I say this advisedly and as the outcome of experience with this class of wheat. I have tried in combination with many mixtures and also alone, and my firm conviction is that where you can lay hold of suitable English, it is best let alone. It is all very well in places where the supply of native wheat is greatly below the demand, as it goes towards making the blend a bit cheaper, but as regards to carrying power it is of no account whatever. The utmost any one can expect from it is its ability to lift itself into a medium-sized loaf, and only that. The yield of flour is also not high, and it loses considerably in bulk weight during the cleaning process. Several merchants having been making various attempts to force it down here, but have not been making much progress, and that too, after a fair trial alone and on its merits. Of strength there is not much, and the statement of a recent writer that it will replace some of the northerns is pure imagery, because impossible. This wheat has been figuring in the distance ever since the Liverpool convention; it is now coming to a head, so to speak, and I predict for it a speedy deliverance from its false position. At the same time, I have no doubt it will find a place in many mills, and rightly so, on account of continually shortening supply of native wheat; but that place will not be in the vicinity of the loaf-raising department. This is the ground of my contention against all that is being said to the contrary."

AN INGENIOUS WATER-WHEEL.

AN order has been given for a power plant of the following description by a Minneapolis man, for use upon a small river in Minnesota. Three canoes are to be anchored abreast in midstream, about eight feet apart, and they will sustain the shafting on which the paddle wheels revolve. The current will run these wheels, gearing will convey to a driving wheel in one of the boats the power developed, and a wire cable will complete the transmission to the shore. Pains will be taken to keep the paddle shaft at right angles to the current. In order to submerge the wheels sufficiently, the canoes will be partly filled with water, the amount being regulated by watertight compartments. Each paddle has a superficial area of thirty square feet, which, when wholly immersed in a rapid current, must withstand a considerable strain. The arrangement is such that the average turning effect is about equal to sixty square feet, immersed all the time.

VARIETIES AND PROPERTIES OF FOOD.

THE remark is quite commonplace, and yet it is worth repeating, that no man can know too much of the particular trade or vocation he is following. There has come before our notice a paper prepared by Prof. V. C. Vaughn, of Michigan University, and read before the Michigan Millers' State Association the early part of the present year. Prof. Vaughn is not a practical miller, but he is believed to have been possessed of a measure of scientific and expert knowledge on the subject talked of, to warrant the association in asking him to convey this information to a body of men who have an experimental insight of the question, and yet it was possible for them to learn something more.

Prof. Vaughn entered quite fully into a definition of a food. What amount of energy does a food contain? What are the properties of a food? What are the different classes of food? Having disposed of the general question, he then spoke of the particular food which millers are engaged in preparing. On this point he said:—

"Flour contains proteids and carbo-hydrates, with traces of fat. The amount of fat, however, is so small that it may be left out of consideration. The most important proteids which are present in flour are the following: Plant albumen, plant casein and gluten. Plant albumen exists in flour in very small amount. It is readily soluble in cold water, and in this way it may be easily separated from the other substances. Plant casein is not soluble in pure water, but is soluble in water which contains phosphates. The amount of plant albumen and plant casein in flour is so very small that we will give our principal attention to the other proteid substance found in flour, the gluten. We may say that there are two kinds of gluten in flour. These are sometimes called gluten proper, or gluten fibrin and gliadin, or plant gelatin. The gluten fibrin is the most abundant proteid substance in flour. It is not soluble in water, but when mixed with water it forms a sticky, doughy mass, and it is by virtue of this property that bread can be made. You can readily see that a deficient amount of gluten in flour would necessarily result in making the flour unfit for bread, because the necessary adhesiveness of the particles of dough could not be obtained. Not only should the gluten be present in sufficient quantity, but it should also be of proper quality. In some flour the gluten does not hold together well. It breaks easily. It is said to be rotten. In a very few flours the gluten is too much like mucus; it is gelatinous. It can be drawn into fine threads, but these threads have no strength. In an examination of flour, a study of the kind and amount of gluten present is of the greatest importance, and if the kind and amount of gluten are normal, the other proteid substances in the flour may be overlooked. Of course, the most abundant food principle present in flour is the starch. The study of the starch grain may be made with a microscope, and any changes which it has undergone may be readily detected.

"Now I come to the practical points of this paper, the examination of flour. I will say nothing about the adulterations of flour, because, so far as my experience goes, adulterations of flour do not exist in this country. Certainly, intentional adulterations are not found. It has been claimed by some that there is an excessive amount of iron in American flours, and this has been attributed to the use of the wire binder. I have examined a good many samples of flour and have never been able to find any evidence of this accidental adulteration.

"I will also leave out of consideration the presence of foreign and harmful grains, because, fortunately, in this country, poisonous plants such as the darnel are never present in sufficient quantity to cause trouble. The miller and the baker know that sometimes a certain run will produce better flours than can be obtained at other times. In some instances these differences can be explained. In other instances no explanation can be found. I think it altogether probable that if flours were frequently examined some light might be thrown upon these unexplained cases. There is, possibly, in many instances, something wrong with the wheat to start with, or something wrong with the care which the farmer has given to the wheat in gathering it or in storing it.

"The following are the practical tests which are applicable to flours: First, the color. The exact shade of color is determined by means of the tintometer. The tintometer consists of a series of plates made with gypsum, the first of which, or No. 1, is made of pure gypsum, the second with gypsum to which a small amount of coloring matter has been added, and the third with gypsum with a larger amount of coloring matter, and so on. The color of the flour is to be taken while it is moist. It may be pressed into a little mold and while moist its color is to be compared with the gypsum plate.

"Second, the adhesive properties of the flour. Flour should not be lumpy, and yet when pressed in the palm of the hand, there should be formed a cake which slowly but spontaneously crumbles to pieces, or when a handful of the flour is thrown against a smoothly planed board a small amount of flour should adhere to the board.

"Third, the amount of water which is in the flour. Good flour contains about 10 per cent. of water, and flour which contains 18 per cent. or more of water should not be considered marketable. The method of estimating the per cent. of water is simple. It consists in weighing out a given amount, say one grain, of the flour, and drying in a closed or box water bath, at a temperature of 190 deg. centigrade, until the weight remains constant. The flour which contains under 14 per cent. of water should be considered, so far as this test is concerned, good, one which contains from 14 to 16 per cent. of water medium, and one which contains from 16 to 18 per cent. of water poor.

"Fourth, the amount of gluten. This is estimated by washing out the starch and other constituents, after which the gluten may be weighed moist, if only an approximate result is desired, or it may be dried at 100 degrees centigrade, and weighed, where exactness is desired. Practically, gluten is usually weighed in the moist condition, and it has been found by a large number of experiments that this weight divided by three gives approximately the weight in the dry state. Thus, a flour which contains 33 per cent. of moist gluten would contain practically about 11 per cent. of dry gluten.

"Fifth, the kind of gluten. This can be determined only by an expert, who can judge by working up the flour with water as to the ductility and strength of the gluten fibrin which is present.

"Sixth, the starch granules can be examined under the microscope.

"Seventh, the bread-breaking properties of the flour should always be tested by a trial baking."

ABOUT PACKING.

IF the rod is in first-class condition almost any kind of packing will answer the purpose, but where it is scored or worn tapering, or is out of line, we must use a packing that will follow up the inequalities in its travel, and to do this without excessive friction the packing must be very elastic. The following plan is a very good one, says the American Machinist.

Suppose that the stuffing box is 4 inches in diameter and the rod is 2.5 inches, leaving a space three-quarters of an inch wide to be filled with packing, and assume that the stuffing box is $3\frac{3}{4}$ inches deep. Take a piece of pure gum rubber sheet packing, without cloth insertion, which is one-quarter of an inch thick, and cut a piece from it 3 inches wide, and of such a length that when it is rolled up into the form of a circle, it will form a bushing for the stuffing box, reducing the space around the rod to $\frac{1}{2}$ inch in width. Care must be taken to cut this so that the ends will meet squarely, leaving no space between them, for this bushing of rubber must be a perfect fit in order to be effective. Next take a piece of firmly made packing, which is $\frac{1}{2}$ inch square, and cut rings enough to pack the rod out flush with the rubber bushing, which we made 3 inches deep, thus taking six rings. These rings should be of such a length that when they are in place there will be at least $\frac{1}{8}$ inch between the ends. They must never be cut so as to make a tight fit, although it makes a neater looking job in that way, for, unless there is room for the rings to expand, the heat will cause excessive friction, sometimes to the extent of burning out the packing and scoring the rod.

We have left a space $\frac{3}{4}$ inch deep, which is sufficient for the gland to enter, but the nuts which hold it in place should not be screwed up with a wrench, but with the fingers only. If there is a leak of steam when the engine is started, it will do no harm for an hour or two, but if the expansion does not take it up then, the nuts may be screwed up until the joint is tight, but no further, for obvious reasons. If packing put in according to these directions does not abolish the disagreeable hiss of steam at each revolution of the engine, I do not believe that any other kind of fibrous packing will do it, and the rod should be turned true and put into line.

So far as flange joints are concerned, it is a very good plan to have them ground so that no packing will be required, but as many of them are not built that way, it remains to select the packing which will render the best service. If the steam is not saturated with oil, we may select any elastic grade that is most convenient, but the flanges of the throttle valve, and any other that may be beyond the lubricator, must be packed with something that will not be dissolved by the oil. A corrugated copper gasket for each of such joints will answer a very good purpose, unless the faces are very rough. If we are to use soft packing, it is well to take a small piece of it, and put it in a cup of oil, and let it remain for about a week. There are several kinds in the market that will not stand this test, for when taken out there will be but little left of them, as they will be either partially or wholly dissolved, but others will be just as good as new after the test, and these should be used exclusively.

Flange joints, when newly packed, should not be suddenly subjected to a heavy pressure, but should be warmed up gradually, and while still under a very light pressure, the nuts should be carefully screwed up until all of the lost motion caused by the relaxation of the packing is taken up. Under no circumstances is it proper to screw up these nuts under a heavy pressure, for if one of them should fail, the additional strain thrown on the others might cause them to break, and a serious accident would be the result.

In making up these joints do not begin on one side and screw up the nuts in rotation, as that will cause the flanges to be brought together on one side, and thrown open on the other, and then when this side is tightened up also, if it does not break the flange, it will cause a very heavy strain to be brought to bear on the bolts, much of which is entirely unnecessary.

In using old bolts for this purpose, they should be put in a vise, well oiled, and the nuts run down on them, until it is known that they are an easy fit a little farther down than they will ever be needed when in place. If this precaution is not taken, it is quite possible for the bolts to be twisted off before the flange is together properly.

In packing a cylinder head it is not necessary to have a large rubber gasket, as some asbestos wicking will answer every purpose at a very low cost. In packing a large valve stem, which is worn down, or has been turned down until it no longer fills the hole in the bonnet, a washer or gasket cut from thick pieces of cloth-insertion sheet rubber packing will answer a very good purpose, if put in first, or if the gland is a loose fit it may be put in last, to prevent the wicking from working into the space around the stem.

NEW KIND OF GRAIN.

SOME interest and curiosity is being attached to a grain that has been found growing in the Himalayan Mountain country. "It is called Kownee," says the American Elevator and Grain Trade, "and the fact that it grows at such altitudes is what lends special interest to it. It looks something like wheat; but very much larger ears. The grains are quite small, of a brown color and quite like wheat. It is not impossible that it is wheat modified by culture and circumstances. It yields very largely, and would be suitable for our mountain and extreme northern territory and for British America. The plant from which the Indian tea, now so popular, was grown, was found growing wild in the same Himalayan districts."

THE NEWS.

CANADA.

—Montreal dealers are agitating for a flour inspector for that city.

—A hundred barrel roller flour mill is to be built at Rosenfield, Man.

—The Welland and St. Lawrence canals will be opened for traffic about April 23rd.

—The flour mill of Mayhew & Myers, at Glen Mills, Ont., is doing a large trade.

—The Portage oatmeal, at Portage la Prairie, Man., has been leased by Jos. Martin to Wm. M. Smith.

—Application has been made to the courts to wind up the Rapid City Elevator Co., of Rapid City, Man.

—J. B. O. Archambault, grain dealer, Montreal, has assigned with liabilities unsecured of about \$21,000.

—The completion of the new flour mill at Glenboro, Man., was celebrated by a banquet attended by ladies and gentlemen.

—A company has been formed to erect a roller grist mill at Ruther Glen, N.B., with J. J. Collins, of Ottawa, as president.

—An appeal to Washington by Dakota farmers in favor of free admission of wheat from Manitoba for seed purposes has been refused.

—The grist mill at Sundridge, Ont., owned by Mr. J. K. Blain, Sterling Falls, has been destroyed by fire. Loss \$3,000. Partly insured.

—W. R. Cahoon, of Marquette, Man., will rebuild his flour mill, which was destroyed by a boiler explosion only a few weeks ago.

—The Canadian Pacific Railway will carry grain in Manitoba and Northwest Territories for seed purposes only at one half the tariff rate.

—Barret's flour mill and contents at Port Hope, Ont., were completely destroyed by fire on the 20th inst. Loss \$18,000. Insurance \$7,000.

—The Lake of the Woods Milling Co., of Keewatin, Ont., will have a store and barrel factory in full running order next summer. About a dozen men will be employed.

—Something over two million bushels of wheat are now in store in Fort William and Port Arthur elevators. Last year at this time there were over three million bushels there.

—Geo. Bull's grist mill at St. Albert, New Edmonton, Man., was destroyed by fire a few days ago. Loss \$10,000. No insurance. Five thousand bushels of wheat were destroyed.

—The Lake of the Woods Milling Company will increase the capacity of their mill at Portage la Prairie, Man., to 800 barrels a day, which will be two-thirds of the company's mill at Keewatin.

—A post mortem examination on the body of a Montreal carter who died suddenly disclosed that the throat was clogged with wheat only partially masticated. Wheat was also found in his pockets.

—J. H. Lafreniere & Co., flour and grain merchants, Montreal, are reported in financial difficulties. It is stated by a Montreal journal, that a few years ago Mr. Lafreniere could have retired with \$100,000, but since then he has sustained losses that have completely wiped out his surplus.

—The large roller flour mill of George Elphick, Pinkerton, Ont., was destroyed by fire on 12th inst. The origin of the fire is unknown, but is supposed to have been caused by lighting. Loss, \$18,000; insured for \$7,000.

—The Acton Flouring mills, of which Mr. John Harvey has been the proprietor for this past eight years, have been sold to Messrs. Cheyne Bros., of Guelph, with all privileges in connection with the property. Messrs. Cheyne Bros. are practical millers, and have for a number of years been conducting the Speedvale Mills at Guelph. It is their intention to remodel the mill throughout, putting in full roller process machinery of the most approved class. Mr. Harvey gives up possession on the 1st of April.

GENERAL.

—The Milling World says that reports from the winter wheat areas generally tell of favorable conditions.

—"When the Erie canal is improved as is proposed," says a Chicago paper, "and grain is carried from Buffalo to New York for 2 cents a bushel we can ship grain from our fields in the Northwest at much less cost for transportation, and give other exporting countries a harder fight for the trade of importing countries. Much Canadian grain also would be exported via the Erie.

—The Rio de Janeiro flour mills, built several years ago in Brazil by British capitalists, are reported to have made in the year ending August, 1893, a net profit of about £10,000 or \$50,000. Considering the serious competition of American flour, which enters Brazil free of duty, and the overcrowded condition of the railways, we must admit that this is an excellent showing; especially so if we compare it with the results of the preceding fiscal years, namely, £2,411 to August 31, 1891 and £5,583 to August 31, 1892.

—An exchange from N. Dakota tells of a leading farmer in that locality, who has decided to change the wheat crop this year on his farms to flax, and will sow 700 acres of ground already prepared for wheat to flax, with 20 quarts of seed to the acre, using press drills. Flax ripens in about nine weeks after seeding and if the season is favorable it is believed that the crop can be harvested and threshed out before wheat is ready and got in the market ahead of the fall rush of flax which breaks down prices. By this means it is possible to take advantage of the present high price of flax and this outlook has induced the change from wheat.

—The West Superior Board of Trade are considering the practicability of opening a sample grain market in Superior for the Northwest. The Superior mills have a capacity for nearly 15,000,000 bushels of wheat, and there is a demand from the Duluth mills for a sample board. The millers were decidedly in favor of the measure, and a guarantee fund was raised to carry the board for one year in order that the project could be thoroughly tried. Several firms of Minneapolis commission and elevator men have decided to open offices in the city to solicit the mill trade. The buying so far has been on the Duluth Board of Trade, but the Superior mills have decided to withdraw their trade from that body.

PERSONAL.

We regret to learn of the death of Mr. Enoch Stevens, father of Mr. N. H. Stevens, proprietor of the Kent mills, Chatham, Ont., which took place at Blenheim, a few days ago. The deceased was a pioneer of his neighborhood, an extensive land owner and a man of unblemished character. He came of U. E. loyalist stock, was a life long Reformer, and had attained the patriarchal age of 87.

CAUSES OF WHEAT DEPRESSION.

SAYS the London, England, Millers' Gazette: Mr. John F. White, the well-known Dundee miller, ex-president of the National Association of British and Irish Millers, recently spoke rather strongly in a meeting of the Dundee chamber of commerce on the question of the causes which have led to the present depression in wheat. He said: "To suppose that the position of wheat arises from the question of currency is simply absurd; 2¼ years ago the price was 42s.; to-day it is 25s. Does any reasonable being say that this fall in price has been to any extent caused by the question of currency? The fall in prices is the result of a surplus of 40,000,000 quarters." We are disposed entirely to agree with Mr. White on this question. Had it not been for the superabundance of wheat in the past three years, the fall in the price of silver and the appreciation of gold in the Argentine would have been of little or no effect. In other words, the price of an article like wheat depends entirely upon demand and supply; when the latter exceeds the former, the price must fall, and when there is excessive competition in the disposal of these surpluses beyond actual requirements, such as we have seen of late, then the effects of the exchanges are superadded. That excessive supplies of wheat are the prime cause of the present low prices is shown by the fact that the average production of wheat in the world in the past three years has been 295,000,000 quarters, against only 275,000,000 quarters, in the three previous years. This is the strongest argument that can be adduced against the statement which one hears so frequently nowadays that "the low price of silver is responsible for the low price of wheat."

A THREE CENT STAMP DOES IT.

ON receipt of a three cent stamp we will mail free to any address a copy of our little hand-book entitled "Rules and Regulations for the inspection of pine and hardwood lumber," as adopted by the lumber section and sanctioned by the Council of the Board of Trade, of Toronto, June 16, 1890. Address, CANADA LUMBER-MAN, Toronto, Ont.

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SOME BOILER EXPERIENCE.

IT hardly seems possible that too much practical information can be cited on the question of handling boilers, and especially when this is in the line of personal experience. An inspector sends to the Locomotive the following notes:

First, and more particularly, I wish to mention a case I met with recently, in which oil caused a deal of trouble. There were eight boilers in the battery, each 60 inches in diameter and 16 feet long. They were all connected together, and were supplied with feed-water through an open heater. In the course of time a new compound condensing engine was put in, in addition to the one they already had. This left only a part of the work for the old engine to do, which caused her valves to rattle badly. The second engineer used oil very freely to stop the noise. The result was that inside of two weeks all of the eight boilers began to leak at the seams next to the bridge walls, the leaks being noticed in all of them on or about the same day. An inspection was made, and tallow-like lumps were found standing on the fire sheets over the grates, quite thickly. A sort of glutinous dirt was also found all along the water line and around the opening to the dome. Water was coming out of the boilers in sheets between the rivets, when they were shut down; and, take it altogether, it was the worst case I ever saw. I expected to have to have some of the seams rivetted over, sure; but I had the boilers cleaned out at once, and put five pounds of rice in each one. I then looked after the heater to see that the trouble there was stopped, and in a few days the boilers were right again. This certainly was the worst and most remarkable case of the kind I have ever seen. The engineer is an excellent man, but the best get caught with open heaters sometimes. He had used this heater for six years, and knew all about it.

I want to refer, next, to boilers with man-holes under the tubes. I find that engineers having charge of boilers of this kind are apt to do all their cleaning from below, through the lower manhole. Many times they do not open the boilers on top, and so, before they know it, the boilers are in bad condition above the tubes, and perhaps filled up with incrustation between them. I find it very important out this way, that they should open on top, as it is impossible to wash the dirt down from the top by doing all the washing from the under side of the tubes.

Bridge walls are giving some trouble, too, in this neighborhood, for the masons set the bridge walls and grates up too close to the boiler, and this causes trouble, especially when the boilers are pushed beyond their fair capacity. I wish we could educate some of these masons out of the notion that a bridge wall must conform to the shape of the boiler, regardless of what the damage is. I have tried, as much as possible, to overcome the belief. I tell them a bridge wall is only for the purpose of keeping the fire from working back off from the grates. I have more boilers broken and bagged from filling up on top of bridge walls than in any other way. It is hard to get most engineers and brick masons to understand that the heat does not have to be forced up, but that it ought to be distributed as evenly as possible all through under the bottom of the boiler.

TRADE NOTE.

The F. E. Dixon Belting Co., of this city, have issued a hand-book of useful information about leather belting, that ought to be, it seems to us, in possession of every man who finds a leather belt a necessary part of the equipment of his mill. And what mill can get along without leather belting? Their little book contains a variety of mechanical tables that are practically invaluable to all interested in mechanics.

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The President, James Goldie, Esq., in moving the adoption of the report on the business of 1892, said: I have much pleasure in drawing your attention to the fact that this company has ventured, in a marked degree, every expectation set forth in the original prospectus when organized in 1885.

Up to the present time the insurers with this company have made a saving, when compared with the current exacted rates, of \$91,004.20. And in addition thereto bonus dividends have been declared to continuing members amounting to \$21,522.72.

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserved (based on the Government standard of 50 per cent.—(50%), a cash surplus of 1.93 per cent. to the amount of risk in force.

Such results emphasize more strongly than any words I could add the very gratifying position this company has attained. I therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted, and the retiring Directors unanimously re-elected. The Board of Directors is now constituted as follows: James Goldie, Guelph, president; W. H. Howland, Toronto, vice-president; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

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AS MILLER—CAPABLE OF TAKING charge of roller mill, any capacity; married; steady and temperate; can furnish good references if required; open for engagement immediately. Address, T. C., miller, 51 Brock Avenue, Parkdale, Toronto.

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EXECUTOR'S SALE

OF THE

"Norris" Roller Mills, St. Catharines;
"Fyfe" Mills, Thorold, and the
Steamer "Persia."

TO LIQUIDATE THE ESTATE OF THE late JAMES NORRIS, the executors have decided to sell the following properties:

MILLS "A and B," on the Welland Canal, St. Catharines, Ontario. Capacity mill "A," 400 barrels; "B" 325 barrels. These mills are on the direct line of water communication between Chicago, Duluth or Fort William and Montreal, and enjoy the benefit of water rates on all grain inward, and flour outward. Both mills have ship elevators capable of handling 1,500 to 2,000 bushels an hour. Grain storage capacity, 60,000 bushels; large flour and feed storage. Steamers can load for Montreal and way ports direct from the flour warehouses at mere nominal cost. Brick cooper shops and ample storage for cooperage stock and barrels. These mills are full roller process, thoroughly modern in all their appointments, and are running daily. The brands manufactured are registered, and are well known throughout Canada and Great Britain, and are standard wherever used. The mills enjoy a large and profitable local business. Never failing water power, costing only \$200 per annum. There is 400 feet dock frontage on the Welland Canal. On the property is a large two-storey stone warehouse, now used for the storage of merchandise in connection with the steamer "Persia." Could be utilized for other purposes, or extra flour and grain storage. Entire premises electric lighted by a modern Thomas-Houston incandescent plant belonging to the property, and at a very small expense over cost of lamps.

STEAMER PERSIA—This boat is in excellent condition, and has always done a large freight and passenger business between St. Catharines, Toronto and Montreal. The "Persia" is a valuable auxiliary to mills "A and B," enabling them to deliver flour at seaboard at a very low rate of freight.

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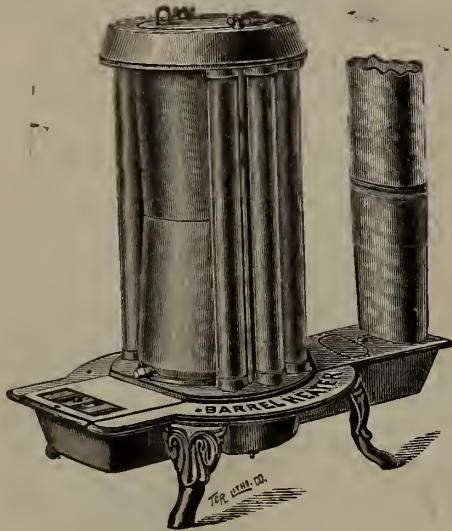
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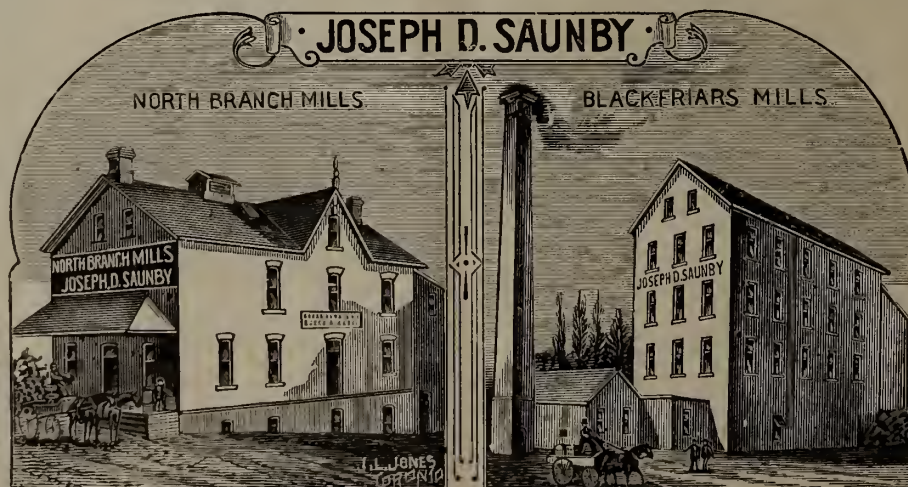
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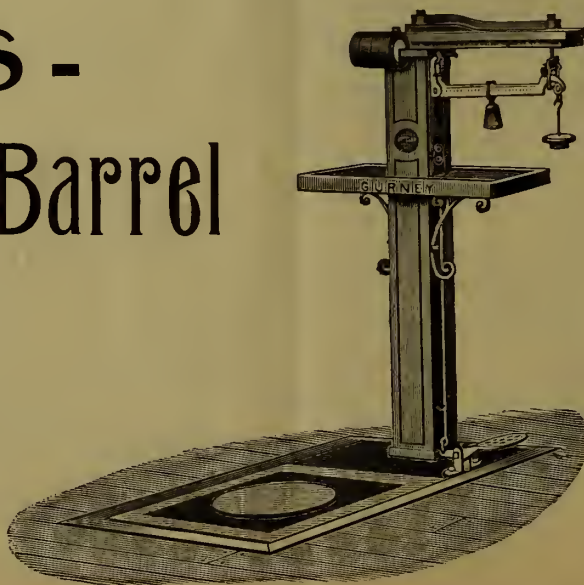
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TORONTO, ONT., APRIL, 1894

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BISCUIT FLOUR.

NOTICE has been taken of some flours which occasionally find their way into biscuit-flour lofts—flours with glutens of so deteriorated a nature that they are just as unfit for biscuit as for bread making. A rough analysis of such flours reveals at once, says the writer in *The British Baker*, the weak spot, and this naturally brings up the question as to the merits and advantages of conducting analysis of flours. It has to be admitted that bakers and millers rarely resort to analytical examination of even the rudest nature—not perhaps so much because they are unacquainted with the different methods as because they are doubtful as to the advantages that accrue to them from adopting such processes. To a certain extent they are correct. Flour is of such a complex nature, and made up of so many constituent parts, that a complete analysis is a very delicate and laborious task, and capable of being undertaken only by those who have had a chemical training, which, unfortunately, few bakers have had. The biscuit baker adopts the more convenient and simpler method of getting at the merits and demerits of a certain flour by baking the flour into a particular biscuit. He takes care (at least he ought to) that the other ingredients put in along with the flour are not faulty, and that the dough gets justice at its various stages. If the biscuit turns out right, then the flour will suit him; if it turns out wrong, then he reports unfavorably of it, and looks for something more to his taste. This, of course, is rather a drastic way of proceeding, and often results in injustice to the flour. The biscuit made from a sample sack of flour may exhibit faults such as blisters or bad shape; the biscuits may spring too much, or may not spring at all; they may all crack up as soon as they begin to cool, etc. If any or all these things happen, the foreman rather hastily may assume the new flour to be at fault. A rough examination of the flour would at once corroborate any such assumption, for, unfortunately, flour is often blamed for producing certain effects on biscuits when it is entirely blameless. The blisters on the biscuits may have been caused by a careless machine-man or brakesman in dispensing his dust too freely, and may have had no connection whatever with the quality of the flour. The bad shape of the biscuits may have been the result of the dough being toughened in the mixing stage, and may not have been due at all to the strength of the flour. The want of spring in the biscuits may have been caused by the sodas and acids reacting on each other before the biscuits were fired, and may not have been due to rotten-glutened flour. The increased spring may have been due to several causes unconnected altogether with the strength of the flour. A superficial examination of the flour itself, however, would result in either exculpating or condemning it on the charge of having produced any of the effects mentioned above. The biscuit baker's task in this respect is lighter than that of the bread baker, for to him the question of tenacity, rigidity, viscosity, etc., is not of such paramount importance as it is to the man whose aim is to turn out the requisite number of well-risen loaves. Unless in the case of the cheaper class of biscuits, sold by count, the biscuit baker deprecates anything which tends to cause extra lightness in his biscuits. In the finer class of goods (especially of the pan series) he has to avoid a flour with such a characteristic. Now, as I mentioned before, anything in the shape of a complete analysis of flour is out of the question in practical work, even if the results would repay the trouble of such a minute examination. There is no necessity, for instance, for the biscuit baker to analyze flour so minutely as the following, in order to find out what particular part of the flour has caused his biscuits to be faulty:

CONSTITUENTS OF FLOUR.

	Household.	Best Household.	Best Whites.
Starch and Dextrin.....	69.04	71.05	70.33
Cellulose.....	.52	.70	.77
Sugar.....	.71	.54	.68
Albuminoids and other nitrogenous matter insoluble in alcohol.....	9.36	7.94	9.40
Nitrogen matter soluble in alcohol.....	6.83	5.05	4.20
Fat.....	1.06	1.22	1.08
Mineral matter.....	.67	.73	.58
Water.....	11.81	12.67	12.96
	100.00	100.00	100.00

In the above analysis it will be noticed that the nitrogenous matter is divided into two portions—that soluble and that insoluble in alcohol. In the former is included gliadin and similar substances, in the latter albumin and fibrin.

For practical purposes the biscuit baker will find it sufficient to ascertain the amount of crude gluten in any particular flour he may wish to examine—*i. e.*, the substance left when flour is kneaded with water, and afterwards washed to remove the starch and the soluble constituents of flour. This crude gluten consists for the most part of three nitrogenous principles—gliadin, mucin and fibrin—together with some of the ash and oily matter. The mode of procedure adopted to eliminate the soluble matter and leave the crude gluten is pretty generally known, but as many readers of this journal may not be aware of the most reliable method of avoiding mistakes, I will take the liberty of giving the necessary details, with all due apologies to those who have them already by heart. A chemical balance is the only apparatus required.

Weigh out about forty grammes of the flour to be examined, and after placing it in a small basin add about thirty cubic centimetres of water and make into a dough, care being taken, of course, to see that none of the flour is lost; let the dough lie for one or two hours; get a piece of fine calico or fine silk, same as is used by millers for dressing flour, and wash the dough on the top of the silk; let a small stream of water fall on the dough while you knead it carefully and thoroughly with the fingers; the water carries off the starch and soluble material from the dough, and they disappear through the silk, while at the same time the silk catches any crude gluten which may by accident become detached from the mass; any which does not become detached must be carefully picked up, and added to the kneaded portion. After this process has been completed, take the lump of gluten and wash it thoroughly in a basin of clean water. The elimination of the starch is best attained here by rubbing vigorously with the hands and fingers; when the water becomes turbid pour it through a new piece of silk, which catches any piece of gluten that may have got separated from the mass; this, of course, is added to the mass. This washing in the basin must be repeated until the absence of turbidity in the water shows that all the soluble matter has been washed away. The water clinging to the gluten is then squeezed out, and the weight of the mass remaining gives the amount of wet gluten. Forty grammes of flour will give from nine to twelve grammes wet gluten.

As there is always (more or less) a quantity of water adhering to the gluten, to get accurate results this wet gluten has to be thoroughly dried, which is done by placing it for twenty or thirty hours in a hot-water oven, and allowing it to cool in a desiccator, which is simply a bell jar placed over a glass or marble surface, and containing within it a small quantity of strong sulphuric acid. The drier mass is then weighed, and the result gives the amount of dry gluten present in the flour. The estimation of the quantity of gluten, it will thus be seen, is an operation capable of being performed by every biscuit baker who may possess a chemical balance; and, though it be but a rude analysis, it is quite sufficient, in nine

cases out of ten, to give a fair idea of what a particular flour is capable of doing, as far as biscuits are concerned. Such an estimation is distinctly valuable as a corollary to the practical test, for it furnishes the reason for the particular result which the practical test may furnish. Take the case of a new flour being baked into a fine pan biscuit. The biscuit comes out of the oven, and has certain defects; say, for instance, it is oval-shaped, has large holes in the bottom, and springs too much. An estimation of the gluten present in the flour will show that it possesses a high percentage of that constituent, and if the gluten be examined it will be found to be of good quality; it will be tough and elastic to the touch. The amount of gluten found, however, will show that the flour is unsuitable for fine pan biscuits. The question dealing with the percentage of gluten most suitable for this class of biscuit has been already treated in the second article of this series.

Take another case where the biscuit will not spring at all. If this result be the fault of the flour, the gluten test will at once reveal it. The amount of gluten found may be fairly high, but the quality will be found to be bad. Instead of being tough and elastic it will be soft and sticky, and perhaps have a musty odor. There is an instrument called the aleurometer, the object of which is to test the quality of the gluten; but the result obtained from it cannot be depended on, and, in fact, the baker, with a little practice, can find from a close examination of wet gluten whether the quality of it is such as is suitable for whatever biscuit he may be wishing to employ the flour.

In selecting flours suitable for cracker biscuits (where the fermentation process is employed), Jago's viscometer may be used with advantage. This is an instrument for measuring the viscosity of dough, and takes into account the somewhat opposing characteristics of tenacity and rigidity. For full particulars of this ingenious invention the reader is referred to Jago's text-book, where details may be obtained. By making up dough and using it at once in this apparatus, and by letting dough made from the same flour lie for some time and then using it in the apparatus, results may be got which give hints as to the methods best suited for fermentation. You can detect by its aid those flours which fall away in the sponge, and such flours must, of course, be either more quickly fermented or, what is better, used up in the doughing stage.

WHY PULLEYS RUN STEADY.

CENTRIFUGAL force has less to do with making a pulley run unsteady than the mere tendency it has of trying to get where it can rotate about its own center of gravity. A wheel is generally looked upon as so much weight and, if held off its center, must go switching about like a heavy stone in a short arm sling, tending to pull the machinery to pieces. This may be well enough at the start, while the wheel is getting up to speed, but the time soon comes when the wheel will try to turn on its own center and let the shaft sling for a while. Just notice how the juggler can seize a dish of any kind, as a dinner plate, for instance, and throw it up in a whirling motion and, while in the air, catch it on the end of a stick and cause it to rotate with ease. At first the plate is switched about by holding it off to one side of the center, but as the speed increases, it gradually brings the point of support near the center, till at last it is allowed to spin on its own center of gravity. In this case all the driving power, supporting force and the resistance of the load were brought to one single point, with nothing to react upon the inertia of the plate. A wheel has recently been fitted up to revolve in a frame with no other force applied to it than what is derived from the vibrations of the frame itself. The wheel, of course, is out of balance, as far as its center of gravity goes.

AN IMPORTANT TRANSPORTATION TOPIC.

THE following letter, to which we have made editorial reference elsewhere, appeared as special correspondence in the *Globe* a few days ago, and is from the pen of Mr. James B. Campbell, a well-known grain dealer, of Montreal. The letter says: In the usual market report of the New York Journal of Commerce, on the 13th of November, I find the following information:—"There is also a fair trade doing still in c.i.f., No. 1 hard Manitoba at $3\frac{1}{2}$ cents over December, which is going into railroad elevators and lying in boats waiting a revival of the export trade. About 400,000 bushels have been added this week to the purchases of over 1,000,000 reported previously."

In the usual commercial columns of the New York Herald of the 27th of March last, the sale "of a lot of 48,000 bushels of No. 1 Manitoba spring wheat at $9\frac{1}{8}$ to 10 cents over May f.o.b. afloat," is reported.

And now for a strictly business letter. This grain was grown by farmers in the Northwest. It was brought to the elevators on the C. P. R. and there sold for 45 cents a bushel and under. It was put on board cars and freighted by that railroad to Port Arthur. It then went on board vessels. It came down during the period of open lake navigation to the United States port of Buffalo, passed on to New York where it finally went into boats in bond, or into bonded railroad elevators, to await their export to Europe. The man in Manitoba who bought that wheat paid 45 cents for it, Brandon freights; early in the market it was quoted at 46c. to 48c. and afterwards lower than even 45c. The question has often been asked, why do Manitoba farmers receive so little money for such fine wheat? The answer is that such are the conditions of trade in our country that they are forced to sell it, not on its merits, but on the basis of the very inferior article represented by the grade of No. 2 American wheat, New York inspection. Most men in the grain trade will assert that such is the mixing of wheat that goes on before the ordinary American wheat reaches New York, that No. 2 wheat, New York inspection, would only grade No. 3 in Chicago. No. 2 wheat in New York is usually 3c. to 4c. cheaper than Chicago, taking the shipping charges into consideration, and it is the wheat of this lowest market which forms the basis of prices for our No. 1 Manitoba.

I shall now prove this. I have shown that on and before the 13th of November our No. 1 Manitoba was selling cost, freight and insurance afloat in New York at $3\frac{1}{2}$ c. over December. That is that at whatever price there were buyers of this inferior grade of No. 2 New York wheat $3\frac{1}{2}$ cents over that price was the cash price which these sellers of our No. 1 received for their grain in New York: in fact, as things go, about parallel with Chicago No. 2.

How did these New York prices suit the buyers in Manitoba? The gentlemen who handle this wheat have not taken me into their confidence, although no attempt is made to pry into their private affairs, a fairly close c.i.f. can be figured by any shipper in the grain trade. Say;—45c. wheat; $11\frac{1}{2}$ c. freight to Port Arthur, 19c. per 100 pounds; $\frac{1}{4}$ c. marine insurance; 3c. freight Port Arthur to Buffalo; $1\frac{1}{4}$ c. Buffalo charges; $4\frac{1}{2}$ c. freight per Erie Canal to New York; total $65\frac{1}{2}$ c. c.i.f., New York.

The official report of New York quotations for wheat for December delivery were: September 30, 73c. to 75c.; October 5, 73c. to 74c.; October 10, $72\frac{1}{2}$ c. to $72\frac{3}{4}$ c.; October 16, 68c. to 69c.; October 20, 70c. to 71c.; October 31, $69\frac{1}{2}$ c. to $70\frac{1}{4}$ c.; November 4, $68\frac{1}{4}$ c. to 69c.; November 13, $66\frac{1}{2}$ c. to $67\frac{3}{8}$ c., and $3\frac{1}{2}$ above these figures was the value of our No. 1.

NICE MARGIN OF PROFIT.

There was certainly a very nice margin, even at the low grade prices, left for Manitoba elevator charges. Every shipper has his own lines laid. I do not pretend that these items are all fractionally correct; they are only taken from the published reports, or well-known trade rates. It is not an easy matter to carry the trade of Manitoba in a few hands. Farmers must have cash as soon as their crops are harvested, and the unfavorable trade conditions governing our country have left them at the tender mercy of New York capital.

Let anyone look into the market reports of wheat in New York, and they will find various prices assigned to

various months for the future. We have had our attention fixed on the 13th of November. The closing prices for that day were cash nominally $66\frac{3}{8}$ c, December $67\frac{3}{8}$ c, May 74c. These higher prices for the future months represent the cost from the cash price for carrying the wheat in store to say the 1st of May, the fire insurance, storage and interest, and men are making contracts for these future months all the time. When the buyer in New York of our wheat made his contract, he immediately sold May against it unless he wished to speculate on the price. He had found a buyer for the like quantity of the inferior article, who was ready to pay him a price which would cover his storage, insurance and interest charges up to the first of May, provided he could always command a premium of $3\frac{1}{2}$ cents a bushel over the price of the month ahead, on account of the excellence of the grain. His profit rested on the quality. In the jargon of the trade, he was "short" on inferior grade of grain for May delivery, and "long" on No. 1 against it.

I accept the statement of the New York Journal of Commerce, that he was awaiting a revival of the export demand. The demand came after navigation had closed on the lakes and no more Manitoba wheat could get to the seaboard except by high rail freights. We read in the New York Herald that he sold some of this wheat at a premium of nine to ten cents and bagged his profit. The four last words are a little addition of my own and not to be found in The Herald. Irrespective of the profit in the carrying trade, it turns out that New York had made a profit of from five to six cents a bushel, and this profit was one which could not have been made except for the exceptionally fine quality of the grain and the result of the trade conditions under which we are running our country. This was not a legitimate business profit—it represented money which should have gone into our farmers' pockets, but went to the New York capitalists instead. If we insist upon doing a three-cornered trade, such as sending our stuff from Lake Superior away down southeast to New York on its journey to northern Europe, we must expect to pay for it in numerous ways besides in the longer freightage. The whole truth and nothing but the truth is that this high grade of wheat had been forced out of the hands of our farmers on the level price of a greatly inferior article, representing at the very best No. 2 Chicago.

Our millers doing business in the Northwest do not want an open market for our wheat. It is to their interest to buy it from the farmers at the lowest possible price, and the finer the quality the more interested they are in bottling it up and keeping it back from the English markets until the transportation on the lakes is closed. Had the wheat had a fair chance, Manitoba could easily have got ten cents per bushel more for her last crop. Let us look at the English markets.

ENGLISH PRICES.

In England the wheats of the whole world come into combination with each other. The sales—not the quotations where there are no bids—reported in The Mark Lane Express of the 12th of March were:—Fine Manitoba, 24s. 9d. per 480 lbs.; No. 1 northern spring, 24s. 9d. per 480 lbs.; Californian, 25s. 3d. to 25s. 9d. per 500 lbs.; Australian, 25s. to 25s. 9d. per 500 lbs.; Argentine, 22s. 3d. to 24s. per 480 lbs.; No. 2 American red winter, 23s. 6d. per 480 lbs.; No. 2 Calcutta, 22s. 6d. to 23. 9d. per 490 lbs.; hard Tanganrog (Russian), 20s. 6d. to 22s. 6d. per 490 lbs.; and beerbohm quotes No. 1 Bombay at 4s. 10d. per 100 lbs., equal to 23s. 2d. per 480 lbs., all on sample. So much for the English opinions of wheat gauged by £ s. d.

I have The Mark Lane Express before me. On November 20, Californian due in a week sold for 28s. On the 27th more of it sold at 27s. 9d. arrived. Coming along to December 11 the following sales are reported: "Old Australians, 28s. 3d.; new crop for January shipment, 29s.; Californian, 27s. 6d. on passage; Oregon, 29s.; No. 2 red winter on Saturday fetched 25s. 3d.; No. 1 hard Manitoba, 27s." Between November 13 and December 11 the price of spot wheat had declined 1s. per quarter in England. It was these wheats which we were outranking in quality and price by March 12.

Wheat at 65 cents in New York, allowing 2 cents New York shipping charges and 2s. per qr. ocean freight, figures out 24s. 4d. c. i. f. Liverpool, and 500

lbs. California wheat were worth about 28s. I have not said anything about Manitoba elevator charges, but if this difference, even striking off 1s. for selling expenses, represents their share of the business, it is about time the country was understanding the price that they pay for the luxury. I insist that 45 cents in Manitoba was based on New York prices, not the English market.

Why did our wheat go to New York when our St. Lawrence was open? Conditions under which we manage the trade of our country sent it there, that is all about it. Gentlemen, when Manitoba has the power she will wring your necks, and serve you right, too. I have tried to make the situation in which our wheat growers are placed as plain as possible; but if anyone is not convinced with regard to my statements about the New York market let him take or send this open letter to any friend in whom he has confidence who is engaged in the grain trade on the Chicago or New York boards, and let him state over his own signature, as I state it over mine, whether that case on the New York Chamber of Commerce is stated fairly as it exists to-day, or whether it is not. And if my case stands solid as to the way this Manitoba wheat of ours is worked on the New York board, what then?

For fifteen years from about Chicago fire days I traded in my own name in the wheat pit of the Chicago Board of Trade. During those years, while not clashing with American sentiment, I maintained myself a Canadian. The foreign element is well known on that board. In returning to my native land I protest with all the little power I have against the conditions of trade as they exist to-day, which are placing our country tributary to New York and our farmers at the mercy of New York capital and local millers. The watershed of the United States drifts toward the Gulf of Mexico; they can make only a limited use of it for their business with Europe. Our watershed drifts right through our country eastward; yes, all the way from the Rocky Mountains, and at its outlet points straight at our best customers in Europe, but a pretty mess we make of it, and the Manitoba cat is being skinned.

I wish for one moment to draw attention to the two watersheds of this continent, one drifting south from north, the other east from west. I only throw out the suggestion that it is going to be very difficult to make one law that will benefit both. If one is stimulated by law it will be at the expense of the other. Water transportation is the only hope for our Northwest, and a glance at the map will show what it is the business of this country to strike for.

GOING STRAIGHT TO MARKET.

Australia has one grand advantage, she looks straight at her market. We are squinters. Prices have been very low all round, but at a moderate estimate squinting has taken ten cents a bushel out of the pockets of Manitoba farmers on their last crop. A gentleman, a leading man of Port Arthur, one engaged in the transportation business, informed me a few days ago that over 6,000,000 of bushels had been shipped to Buffalo. The editor of The New York Journal of Commerce writes me that 1,525,000 came to New York, that 600,000 went to Boston, that it went up to nine cents premium, and that it has been about all cleaned up now by exports. This 600,000 to Boston was particularly aggravating, for it must have gone by rail from Buffalo, and to Boston is 499 miles, while from Collingwood to Montreal is only about 340.

Under present trade arrangements there is very little relief to be obtained. The block is here in Montreal. We have neither the transportation facilities for a large business, nor have we the tonnage. I am informed Buffalo handled 200,000,000 bushels of grain and flour during navigation last summer. If we are to depend on New York, Manitoba must sweat. Suppose we arranged our business so that our farmers obtained better prices than those south of the line, and paid less for their wares would there be any trouble about emigration? Present arrangements permit of large lines of our best wheat being collected at the seaboard and held there without any real risk by those who can pay for it. After navigation closes the holders of this wheat, being protected by the higher rail freights behind them—S. H. Thompson, Secretary of the Duluth Board of Trade, has asserted that rail freightage in the States is seven times

dearer than water freightage—and in possession of the cheap freightage of the ocean, are in a position to deal out this wheat to the millers of Europe at the premium which the quality commands.

There is an economic revolution impending. It may take time and will come to a head gradually, but the development of Argentina and other cheap-labor countries must affect the conditions of life on this northern continent, and we must change with the times or stagnate. These cheap-labor countries are coming to the front with vast quantities of low-grade wheat. On the other hand, we happen to produce the wheat which outranks every other wheat in the world in quality, and when our producers succeed in securing a crop of such magnificent quality as they did last year, it is a scandal that they do not get the benefit of it. No one can tell what next year's crop will be in quality, quantity or price, but I see on high authority that we are to have wheat up to \$2 a bushel in eighteen months. I believe in encouraging the farmers to plant all they can; the United States crop is to be patchy, and at moment of writing California is in a ticklish position. But there is more to be done than encourage them to plant. Whether Manitoba is to get the benefit of her labor depends on whether the situation of the past fall is to continue or not.

Is it not suggestive that when the farmers' wheat was pointing to the elevator 45 cents was all that could be got for it at a time that California wheat was selling in England for 28 shillings for 500 pounds, and to-day when the wheat has passed out of the farmers' hands, and California wheat is selling for 25s. 6d. in England, 50 cents is reported to be about the price in Manitoba. I do not know what other Canadians may think, but 45 cents in Manitoba and 28s. to 29s. in England is a little too much for my weak nerves.

THE AGED BOILER.

THE life of a boiler, says the Age of Steel, like that of a horse, has its limit. The number of its birthdays depends, of course, on its original stamina, and the use or abuse of its service. If sound in material and construction, and intelligently handled, its term of life is prolonged into a respectable old age, and to this on these conditions there is necessarily a limit. It is possible, however, that any arbitrary limit is beyond absolute calculation, and is likely to overlap dates that at the best can only be approximate. The biography of a boiler is one of strain and tension, and is subjected to sudden transitions from a high degree of heat to the temperature of cold air or water suddenly admitted. That iron should lose its qualities as a boiler plate in the course of years it is reasonable to assume, and that when age and service have reached a certain point the conditions of safety are weakened, is equally reasonable. The basis of calculation must, however, necessarily vary, as the qualities of the metal used may not be uniform, nor the intelligence of service always at the same standard. From tests made of plates taken from iron boilers, varying from fifteen to thirty years of service, it has been found that there has been not only a loss in tensile strength, but also a marked loss in ductility. A plate that originally stood a test 45,000 pounds tensile strength after about twenty years of service, shows a deterioration of tensile strength to about 38,000 pounds. On this basis alone the conclusion is that the boiler, if weaker, is still good for considerable pressure, with the fact, however, left that the plate under certain conditions would act as a piece of cast iron would act, and also suddenly give way at a certain pressure. It is obvious that a boiler constructed of plate of this character would never tempt the money of a steam user. It might have a higher tensile strength than cast iron, but in the matter of brittleness the advantage would be scarcely apparent. As most, or many, boiler explosions are caused in whole or in part by a sudden shock, a boiler plate of a brittle nature is broken by a blow, which would be as ineffective as a drum tap on a plate of lower tensile strength. Here the quality of ductility asserts itself as indispensable to boiler safety, allowing it to sustain heavy shocks or strains without giving way. The presence or absence of this quality determines the value of old boilers so far as their safety goes, and for this reason it is the opinion of many engineers that boilers of the cylindrical-shell type are in their dotage at about twenty years of service.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

IS THERE A WAY OUT?

To the Editor of the CANADIAN MILLER.

Sir,—For a year or more millers have been toiling on, hoping, until the heart has grown faint, that the prices of breadstuffs would show an improvement. But almost no change in conditions seems near by. What are we to do about the matter? For one thing, it appears to me that we have got to watch with more diligence than we have been doing in the past the little economies of mill management. No doubt the past year has been severe enough in its experiences to compel all millers to exercise greater prudence than perhaps they had previously done; but still I have an impression that for a long time back there has been a want of proper business methods in the handling of milling business. There are two sides to milling. The practical man may be a first class operative miller, turn out good flour and understand the mechanical management of his mill, but he may be woefully wanting in business ability. Do business with such a man and you will find there are leaks all through the mill. He is probably an imprudent buyer, lacks in executive ability, and does not handle his help wisely. He is, worst of all, perhaps, careless, slovenly in his book-keeping and office management, and let him get into financial trouble and you will find that his profits have gone in bad debts, that might have been collected if they had been looked after at the time; and in bad book-keeping generally. As my brother dusties quietly smoke the pipe of leisure, after the day's work is completed, let them think over what I have said here, and if I am out in my delineation of the case, no doubt the columns of the "CANADIAN MILLER" will be open to rasp me for what I have said.

"DECENCY AND ORDER."

A BROADER VIEW OF THE TARIFF.

To the Editor of the CANADIAN MILLER:

Sir,—From several articles that have appeared in your columns, I would judge that you take the view that it would be a mistake, in the interests of the milling industry, if there were reciprocity in flour with the United States. There is something to be said directly from the business standpoint on this question. For one, I do not entertain the fears of some members of the trade, that the altered conditions, as between now and when the former reciprocity treaty between these two countries existed, have so changed that what was good for the millers of Canada then would be hurtful to-day. I believe that milling methods are as far advanced here as in the United States; that we have as capable millers, and that with an enlarged field, we can produce flour as cheaply as United States millers. But aside from this phase of the question may we not, as millers, take a broader out-look, and believing that the pulling down of trade barriers would be a benefit to the great consuming trade of the country, for this reason favor free trade in flour. Now, I am well aware that the reply will come from some brother millers, that there is no business in an idea of this kind. Millers, we will be told, like everyone else, must look after number one. Let the people look after themselves. Perhaps this is business, but it is selfish business, and the man who has read commercial and economic history with care has surely learned that the generous principle is, in the end, the most successful and paying. Any plan that will be helpful to the masses of the people is going to be helpful in the long run to the individual classes. The people cannot be put in the way of securing cheap bread without the men, who make the flour that makes the bread, being helped. These at least are the sentiments of

ROLLER MILLER.

SKILLED VS. SCRUB LABOR.

To the Editor of the CANADIAN MILLER.

Sir,—The publishing in the last issue of your valuable journal of the curriculum of a German milling school gives some emphasis to the need there is for skilled labor in milling. We live in a day when, unfortunately, the disposition of too many men, in every vocation, is to adopt short cuts in the attainment of their purpose.

Boys want to become journeymen after they have spent a year or two at their business. The result is that every branch of industry is loaded up with a host of imbecile workmen, and one reason why so many men are out of employment to-day is because they rank among the incapables. Take the census of the unemployed, and it will be found that among them there are few really skilled workmen. The good men get work. The chaff in the field of labor, as in that of agriculture, is cast aside. What I have said here as general to all trades, is, I believe, perfectly applicable to milling trades. More than at any time in the history of milling, experienced, skilled, educated operative millers are needed. The man who undertakes to fill the responsible position of miller must in the first place be a careful student of everything that pertains to the grinding of wheat into flour. He must go back of this, and have a knowledge of the grades and constituent elements of wheat, so that he can readily discern a good milling wheat from that which is ill-suited to such a purpose. He must more than this be possessed of a mechanical turn that will enable him to detect a weakness in the equipment of the mill in his charge, and ought to be able, after proper experience, to suggest to the mill-wright much in the way of improvement. All this means study and labor, but let millers remember that in their business, as in every other calling, there is no royal road to learning. We want no scrub millers.

Yours truly,

INDUSTRY.

THE HIGHEST WINDMILL TOWER.

THE town of St. James, L. I., can boast of having the highest and strongest windmill in the world. The proprietor of the land on which it has been erected tried for years to construct a well on the elevated land near his house, but without success. The spring from which the windmill pumps is on the beach at the head of a distant bay. The contiguous land rises so rapidly and the trees are so high that it was necessary to raise the windmill 150 feet, so that the bottom of the wind wheel would be above all obstructions within 1,000 feet of it. The scale on which the mill is erected can be seen from the fact that there are twenty barrels of cement in the foundation piers, besides forty barrels of cement, 20,000 bricks, 42,000 feet Georgia pine, and more than six tons of bolts and washers and iron plates. It is 22 1-2 feet in diameter and 190 feet above high water. There are 6,000 feet of pipe between the windmill pump and the reservoir, which contains about 65,000 gallons. The windmill has frequently filled it in two days. The maximum height to which the water is forced by this mill is 223 feet, before reaching which it has to pass a long line of pipe. There is no difficulty, however, in making a plant to throw the water much higher than this. It is merely a question of the pump, pipe and fittings being able to withstand the pressure, and the windmill being large enough to give power sufficient to do the work. Pumps are made strong enough to raise water 2,000 feet if necessary. The only question to be carefully considered is that of the tower, for it must be made to withstand the roughest weather likely to be met with in these latitudes.

WHEAT IN NORTHERN CANADA.

THE Winnipeg Commercial contains an interesting and suggestive note. It says that about April 1st there arrived at Edmonton, N. W. T., the plant for a small flour mill to be erected at Fort Vermillion. By reference to a map of Canada, Fort Vermillion will be found on the Peace River, in latitude 58 deg. 25 min., and west longitude 117. 30 min., so that the destination of the mill is over one thousand miles further north than Toronto, and about in line with Fort Churchill, on the Hudson Bay, and Cape Wrath, on the North Coast of Scotland. The Peace River empties into lake Athabasca, about 250 miles east of Fort Vermillion. On the north shore of this lake stands Fort Chippewyan, from which place wheat weighing 68 to 69 lbs. per bush, was sent in 1876 to the Centennial Exhibition. Wheat has been grown in Canada as far north as Fort Simpson, on the Laird River, in latitude 62, nearly 250 miles further north than Fort Vermillion, but it is doubtful whether the wheat lands extend beyond the Peace River Valley. The fact that a flour mill is to be established 550 miles further north than Winnipeg is, perhaps, as conclusive proof as could be advanced that the Peace River country is well adapted to wheat production. Fort Vermillion is, as stated, about 350 miles north of Edmonton, and 2,300 miles from Toronto to Edmonton and can now be covered by rail.



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The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

PRESIDENT VAN HORNE AS A PROPHET.

THE exceedingly optimistic view of the future of wheat prices as told by Mr. Van Horne, president of the Canadian Pacific, in an interview published in another column, is creating abundance of talk and criticism, even though it may not bring wheat at an early day up to \$2.00 a bushel.

With his opportunities of studying the question Mr. Van Horne's opinion on a subject of this kind ought to be worth a good deal, but after wheat has been hovering around 55c and 60c a bushel for many months we are afraid there are few ready to pin their faith to the prediction of the great railroad magnate. One must admit there is logic in the contention that the cheapening of wheat will cause thousands who have hitherto ate rye, and other edibles less tempting than those, to eat wheaten bread. This would mean a large increase in the populations of the world consuming wheat and would serve as one element in helping wheat prices. Another contention is that the continued lowering of prices of wheat will drive large numbers of farmers, who are now producing wheat, into giving their attention to other lines. But these conditions, favoring an increased price of wheat, are largely, if not more than offset by the rapid increase in the growth of wheat producing countries, as instanced by the opening out of large wheat fields in the Argentine republic and the development of the wheat fields in India and Russia. The accounts that we get from these countries would appear to show that there is large room for development in the future, thousands upon thousands of acres yet waiting for cultivation. What is also the case in most of these foreign countries the cost of raising wheat is a great deal less than on this continent and this, it must be admitted, is not a favorable condition to increased prices. At the same time, whilst we cannot be sanguine of \$2.00 for wheat, it would look as though a better price than the present might prevail in the future.

THE WHEAT-PRICE PROBLEM.

ANYTHING that will shed intelligent light on the problem of the low price of wheat, that is now agitating the people of all countries the world over, is acceptable reading to every student of this question. A contribution of more than average importance on this line is a letter of Mr. James B. Campbell, of Montreal, published in the Globe of the 21st inst., and which we republish in full in another column of the MILLER. Some of the figures and quotations that this writer has gathered together will bear careful study and thought. The

import of the letter is in the contention that Manitoba farmers are receiving only 45c for No. 1 hard wheat, while the same wheat sells in the English market for about double that figure. It is known to our readers that the larger part, if not all of Manitoba's export shipments to the United Kingdom, go by way of New York grain dealers. Where the heavy expenses come in that swell up the price of this wheat nearly double is the problem that Mr. Campbell strives to solve. It is suggested that this cost may in part come from unfair elevator charges in the Northwest, but Mr. Campbell, himself, does not give credit to this criticism.

The question is believed to be one of transportation and it is in this particular that Mr. Campbell's letter is both suggestive and instructive. Here is Canada possessed of a water-way through the St. Lawrence that is the natural outlet to the European markets and yet the greatest wheat-growing section of this Dominion is sending its exports by way of an expensive and unnatural channel. We have, as a Dominion, to solve this water-way question. The policy at present may be, and this is probably accentuated by the financial stringency of the times, to withhold any large expenditure on capital account, but we have yet got to place our waterways in that shape that the large grain exports that this country will send forth to Europe shall go through our own waters.

That any section of our grain producing people would seem to have placed themselves, whether by necessity or choice, in the hands of capitalists of a foreign country, is a point that is full of suggestion and ought to cause earnest reflection from the business men of our Dominion.

MR. VAN HORNE OFFICIALLY.

THE report of the year's business of the Canadian Pacific Railway Company, furnished shareholders at the annual meeting in Montreal, on the 4th inst., is interesting reading alongside of the wheat prophecy of the president, Mr. Van Horne, which was given out about the same time. The company, whilst showing a satisfactory business, have to admit a decrease in profits for the year. This change in the situation, over previous years, is accounted for by the extraordinary depression in the prices of wheat, influencing farmers to store their wheat, rather than sell it, and, in so doing, avoiding immediate transportation. The losses, it is pointed out, are entirely west of the great lakes, the company's eastern lines showing increased earnings.

In their official capacity, the president and directors give their opinions on the probable future of grain. What the business of the company in the near future will be will depend on the prices of grain. If these continue, as now, abnormally low, no marked development of traffic is expected. But Mr. Van Horne does not officially, it is a different matter when he is talking to our friend "Don" of Saturday Night, hold out any unusually sanguine hopes of what prices in the future will be. The report is content with saying: "There are, however, indications of improvement in various directions."

Touching on the cost of transportation, and this is a matter of interest to grain men and millers, the directors take the position that, although the price of grain in the world's markets have never been so low, yet, western farmers have, on several occasions received no more for wheat than at present, for the reason that the cost of transportation has been greatly reduced in late years. This is an expression, that adds interest to the question of transportation, as discussed by Mr. Campbell in another part of the MILLER this month. There can be no doubt, with profits in grain growing and milling, cut as low as they have been of late years, that the future of these trades will rest largely on the facilities and the cost of transportation of these products to foreign markets.

The people of Canada will, we believe, generally, agree with the directors of this great road when they speak, not only in hopeful, but glowing terms of the fertility of the soil and the fact that nowhere in the world is there to be found a wheat producing area where the quality of the wheat is superior to that grown in the Canadian Northwest.

DUTY ON WHEAT AND FLOUR.

A LIVELY brush took place in the House on Friday before the committee of Ways and Means over the tariff proposition touching wheat and flour. Mr. Charlton raised the question, which, however, was not new to millers, why wheat and wheat flour had not been included in the reciprocity offer of the Canadian government to the United States. The reply came prompt and decisive from the Minister of Finance, that this was not done, because it was not considered to the advantage of Canada to offer wheat for wheat or wheat flour for wheat flour.

The introduction of the matter in this shape opened up the old question of whether Canadian millers would be gainers or losers by having the enlarged market for their product thrown open to them. Mr. Martin, speaking for Manitoba, said that the duty on wheat was absolutely of no value to Northwest farmers and to this remark he added that the grinding-in-bond privilege destroyed all the advantage. Mr. Campbell, member for Kent, argued vigorously for reciprocity in flour. He holds to the view that Ontario millers would be benefited by having the United States market thrown open for their trade. The discussion was participated in by prominent members on both sides of the House and the opportunity was not lost by Mr. Davin to renew his protest, which had been introduced last session without success, against the grinding-in-bond privilege. To the various objections Mr. Foster was very firm in stating that he believed that there was not one miller in ten who favored reciprocity in flour.

The ground on this question has been pretty fully gone over in these columns. Whilst it is the case that a certain proportion of the milling trade, who find an able representative in Mr. Campbell, himself a large miller, hold the opinion that Canada need not fear reciprocity in flour products, yet the view of the Dominion Millers' Association was, perhaps, not entirely unanimous, yet largely so, against this contention. There is this to be said, that the milling trades here are already handicapped to some extent, and it would be a serious blow to them if they should find their market broken into through the province being flooded with flour products from across the border at a price which they could not with profit, touch.

EDITORIAL NOTES.

INFLUENCED, no doubt, by the example of France, the Italian government is moving in the direction of placing an increased duty on wheat. There, as in other countries, there exists a strong rural discontent. Just in passing, it may be remarked, that nearly all over the world the chief centre of discontent is among the agricultural classes, a people whose lot has always been held up as a most happy and contented one. As regards wheat producing countries the effect of this new trade barrier will be to cause larger quantities of wheat to go through these places to the countries where no such barriers exist. We are not sending wheat from Canada to France or Italy, but these people had been getting their supplies from Austria, Germany and Russia. These will now seek other fields and in this way the competition with Canadian wheat will be increased.

THE hopeful words of Mr. M. McLaughlin in his annual address at the last meeting of the Dominion Millers' Association, though they may not bring immediate relief to the depression in wheat prices, ought to be full of encouragement to all who grow or trade in wheat in Canada. He then said: "The country which grows the best wheat known to the milling world and, which has only begun to bring under cultivation the millions of acres that produce it, has a future that cannot be shown in colors too bright." This high tribute to Canadian wheat this well-known miller said was based on the judgment of English millers, who were at all times prepared to pay the highest price for the hard spring wheats of Canada. At a time when those concerned are discussing the question, how far it is wise to extend the cultivation of wheat in this country or whether, indeed, it may not be prudent for farmers to turn their energies in another direction than wheat growing, these words of the ex-president of the Millers' Association may be taken, in the language of a well-known provincial statesman, into the serious consideration of everyone interested.

TALKS WITH OPERATIVE MILLERS.

WHY be distinctive in the heading of these talks? someone may enquire. The reason is: We draw a distinction between the man who makes the flour and he who looks after the business end of the concern. The same man may do both, but the purpose of these talks will be to help directly in the line of making the flour. In a word, we are going to walk in among the rolls and scalpings and rub against the miller himself. I would like, really, that the operative millers themselves should do most of the talking in this column of the CANADIAN MILLER from month to month. Every day some matter doubtless occurs to the miller, that raises an enquiry in his own mind and that might be answered by someone else, if he would only let that someone else know what is troubling him. Again, he, likely, has a particular suggestion, born of his own experience, that is worth while naming to someone else. Do you catch on, brother dusties?

* * * *

The man at the business end of the mill is concerned over the future of bran and shorts, to the extent that the offal will help to level up the low price of flour today. From this point of view he has encouragement in the fact that of late a very decent price has been obtained for bran and shorts. The man inside the mill is going to help him out all he can in way of suggestion; and I have learned lately that aside from many purposes for which bran is used, giving commercial value to the article, for it may be known that the tanner, the calico printer and even the manufacturer of children's dolls, cushions and kindred articles finds bran of use to him, it is now being used as a very good substitute for coffee. The claim is that it is perfectly healthful, especially for children and dyspeptics. Two quarts of bran, mixed with it a cupful of molasses, mixing and rubbing it well together until it is moistened alike, makes a very palatable and inexpensive breakfast drink. Let the man inside try the experiment, and a new use for bran will, perhaps, have been found.

* * * *

Not a little trouble has been caused millers since the introduction of round reels. One difficulty, I presume, has been in not knowing exactly how they should be handled and what is the outcome of work upon them. The cloth itself sometimes wears a great deal faster with round reels than with the hexagon reels. Now, what is the cause of this? There is very little difference in the speed of the round reel and the hexagon. The cloth cannot, therefore, be taxed more in the one than in the other case. It is true, however, that every inch of cloth is brought into actual use in the round reel. Then with the hexagon reel the stock is thrown against the cloth with great force. Contrariwise, because the stock falls a distance of rather more than two feet and is dashed upon the cloth, very little pressure is required by the hexagon reel, while the round reel calls for an automatic revolving brush kept running at a high speed. Where the millers need to exercise judgment is in applying the brush and not allowing it to act upon the cloth with too great severity.

* * * *

I have come across a clean-cut statement from a milling writer against the value and work of patent flour. His words are these: "In my judgment patent flour making is a prostitution of the business and is illegitimate." This is a stiff statement from a practical man and the argument is, that millers have been driven into the making of patent flour, simply because of a whim of the public who had got the idea that there was something nicer about this modern-made flour than some of the products of a few decades ago. I take it for granted that every miller knows, generally, of the history of patent flour. A quarter of a century past patent flour was unknown, and, as someone else has said, to the millers of an early day, the products of which patent flour is now made was an objectionable article; a product they would gladly have avoided making, or doing anything with, if it could have been done; but it was ever with them and they had to make the best of it. It was ascertained, because of the hardness and brittleness of spring wheat, that it could not be ground on burrs or by any other means without having a large middlings

output. Then the flour was dark in color, contrasted with what would come from the softer, winter wheat. So it was that an ingenious individual came along and invented the middling purifier and we have gone on making our patent flours steadily and increasingly to this day. It is a case, I suppose, when in Rome we must do as Romans do. When the great consuming public demands some particular article we are obliged to give it to them, though it may go a little against our own notions of what is sensible and best.

* * * *

The danger with many people is to go to extremes. The pendulum of the clock swings rapidly from one side to the other. Necessity arises for strong measures to cure an evil, and with many the operation is carried too far. For a year past there has been, and there was good cause for it, a great outcry against dirty wheat, and the miller has been most careful to see that the wheat that came into his mill was thoroughly cleaned before he started to turn it into flour. A writer in the Milling World considers that this practice has developed into a perfect fad. While not depreciating the need of using only clean wheat, he says that an investigation will show very often that, what looks like dirt is only a bran-coat. He says that the bran-coat plays so important a part in breaking, reduction and purification, that it would be a mistake to weaken the coat by brushing and scouring too far. If broad bran be essential to cleaning it should not be so severe as to weaken the coat so that it will not break "broad." Broadly speaking this writer says wheat is as clean as it ought to be for the rolls when its coat, absolutely intact, shows no awns, no black matter in the outer crease, and no surface depression containing dark foreign matter. Late revelations concerning the crease-dirt shows that the crease actually folds on itself in such a way that a part of the dark matter is really inside the grain. This fact, established, it would seem incontestably, by the photomicrographs of Mr. F. Garton, the English experimenter, at once puts a stop to the attempt "to remove all the dirt in the crease," and it to that extent simplifies the work of scientific and practical cleaning. The idea of using water for cleansing the coat has a basis in reason, but whatever good water is able to accomplish in cleaning the skin of wheat, it offsets by the inevitable trouble it causes in the chemistry of the berry. The ideally clean wheat is a washed wheat, but wetted and steamed wheat is not so good after wetting and steaming as it was before. American millers have generally avoided the wetting process, and even the European millers, who use it extensively, use it under protest. Some oriental and Russian wheats ground in western Europe are so very dirty that nothing but thorough washing will answer.

JAS.

DOMINION MILLERS

WILL FIGHT THE RAILWAYS ON DISCRIMINATING FREIGHT RATES.

A MEETING of the executive of the Dominion Millers' Association, fraught with much interest to the future of milling in Canada, was held in the Board of Trade building on Tuesday 17th inst. There were present, A. H. Baird, of Paris, president; Wm. Galbraith, M. McLaughlin, J. L. Spink, and C. B. Watts, of Toronto; J. D. Saunby, London; W. H. Meldrum, Peterboro'; J. D. Flavell, Lindsay; James Goldie, Guelph; H. Barrett, Port Hope, and J. Galbraith, Allandale.

The following millers were elected to membership in the Association: W. H. Schneider, Mildmay; Rollins & Williams, Exeter; Bennett & Constable, Spencerville; S. Copeland & Son, Penetanguishene; G. E. Martin, Lindsay.

A resolution was passed instructing the secretary to communicate with the Dominion government, protesting against an increase of 10% duty on half-bleached jute bagging, for the reason that such goods are not woven in this country or are likely to be.

The Ontario government are to be communicated with asking that in tenders for public institutions in future the specifications be made to call for standard grades of flour.

DISCRIMINATION IN FREIGHT RATES.

The important business of the meeting was to consider a report of the freight committee, which had been in session for some time prior to the hour of calling

together the executive. Following up the work done at the last annual meeting of the association in the direction of making right the discrimination in freight rates against flour, and also to counteract the one of under-billing, a delegation of the freight committee had visited Montreal twice during February and March, where conferences were held with the head officials of the Grand Trunk and Canadian Pacific railways and with representatives of the various steamship lines regarding export rates on wheat and flour. The committee reported as a result of their investigations that very unfair discriminations in freight were made against flour. A rate of 20c per 100 lbs. was given on wheat for export, while the rate from Ailsa Craig on flour was 29c. The rate on grain on the 6th of March from Chicago to Liverpool was 27.34c per 100 lbs., while on flour it was 27.44c, whereas at the same time from Ailsa Craig it was 26c per 100 lbs. to the same port. A rate of 14c per 100 lbs. has been given this month by the Grand Trunk on wheat from points west of Toronto to Liverpool, and they refused to accept less than 20c per 100 lbs. on flour.

How completely these discriminating rates have operated against export trade is shown in a letter received from David Plewes, agent of the Ontario Export Association, Liverpool, Eng., and read at the Montreal conference, when the Hon. Mackenzie Bowell, Minister of Trade and Commerce, met with the various railway representatives and Mr. M. McLaughlin and Mr. C. B. Watts, of the Dominion Millers' Association. The letter is dated Liverpool, Eng., January 25, 1894, and is as follows: "In reply to your favor of the 12th inst., 17-9 to 18 is the very highest obtainable, but I ask you how can I sell flour when your freight is 29c per 100 lbs., when wheat is only 20c per 100 lbs. The thing is impossible. If arrangements could be made so that your freight on flour were even 2c per 100 lbs. over the current rate of freight on wheat I could sell lots of flour. If you had a 22c rate on flour alongside the 20c rate on wheat you could have filled all the orders I have sent you. Why don't your association pull in this direction? If there is no better arrangement made to get better comparative freights on flour as against wheat I will return in June, as it is utterly impossible to sell freely against such odds in freight."

This letter clearly explains the situation. Wheat is being carried to the old country at equal to from 3 to 5c a bushel less than the charge for wheat. In other words the English miller buying our wheat has an advantage over the Canadian miller equal to about 20c per barrel in freight alone. Not only this, but any mill doing an export business is compelled to bring wheat in on which they pay an average of say 5c per 100, which added to the discrimination of 9c per 100 lbs. mentioned by Mr. Plewes makes a total of 14c per 100 lbs., which a mill exporting flour is charged more than the grain exported.

This is the wrong the Dominion Millers' Association have set themselves to remedy, and a result of the deliberations of this meeting was to pass a strongly worded and determined resolution setting forth the unfairness of the present discriminations, noting the fact that these unequal rates are given in direct opposition to the law of the Dominion government freight tariffs, and instructing the secretary to write to the General Manager of the Grand Trunk Railway, respectfully asking him to furnish satisfactory assurance to the effect that henceforth any special rates given to shippers of wheat shall at the same time be offered through the secretary of this Association, to all millers who may wish to avail themselves of such special rates. Failing to receive this satisfactory assurance, the secretary is instructed to lodge complaint before the Railway Committee of the Privy Council, and press for the carrying out of the Railway act, section 233 which says: "No company shall make, or give any secret special toll, rebate, drawback, or concession to any person, and any company shall, on the demand of any person, make known to him any special rate, rebate, drawback, or a concession given to anyone."

A copy of the resolution was ordered to be sent to the Hon. Mackenzie Bowell, minister of Trade and Commerce, and to the General Managers of the Grand Trunk and Canadian Pacific Railways.

The executive of the Dominion Millers' Association will meet regularly the second Tuesday of each month.

COOPERAGE D'P'T.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

THE MONTH'S TRADE REVIEW.

DURING the month of April the demand for dry cooperage stock has increased considerably and all last year's stock is about wiped out, in fact, a good many staves cut this year are now being shipped to fill orders.

The first vessel for the North-west was loaded a few days ago with 500,000 No. 1 28½-inch flour barrel staves for Minneapolis to go via Gladstone and the Soo line.

Navigation to Duluth has not yet opened, but a vessel is engaged to sail the 1st of May with 35 car loads of staves and hoops, the hoops for Fort William and the staves for Duluth. This vessel was originally engaged to sail on the 20th inst, but owing to the ice not being out of the bay at Duluth, the vessel will be unable to leave before the 1st of May.

The demand in the North-west is at present very good for dry flour barrel material, and a great many of the shops are buying kiln-dried stock at an advance of 25c. per thousand over air-dried stock.

The eastern markets have also been much better this month than for the previous three months, and coopers are beginning to realize that prices are likely to advance all along the line.

The flour trade in Canada has been rather quiet, and not many of the mills are running on full time, consequently the demand for flour barrel stock in Canada is not very brisk at present.

We do not anticipate there will be any advance in prices on cooperage stock in Canada for the next sixty days; after that, if the present prospects of a large apple crop continue good, we anticipate an advance in prices, as there has not been half a stock of logs got out in Canada this year, and the heavy rains we have had recently have flooded the woods so badly that no operations can be undertaken in the way of getting in logs for the next two months and probably three months.

The large salt works at Windsor have commenced operations again and if the wells hold out and no further accident takes place to them they will consume a large quantity of barrel material. This company use a very high grade of stock, almost equal to flour barrel stock, and of course will take a good deal of material off the market.

The following are the present ruling prices for cooperage stock delivered in Toronto, Ont.:

	Per net 1,000
No. 1, 30" jointed flour barrel staves.....	\$5 80
M. R., 30" " elm staves.....	5 45
" 2, 30" " "	3 80
" 1, 24" " "	4 60
No. 1, 5½ft. patent coiled elm hoops.....	6 00
" 1, 6½ft. " "	6 60
No. 1 17 1-7" kiln dried heading.....	Per set 4¼c.

The above prices are for high grade stock, for lower stock from small mills and where the timber is poor these prices have been shaded from 10c. to 25c. per thousand, but these are the prices that are asked by first-class mills for the highest grades of stock.

The above prices are for full car loads or mixed car loads of stock, for less than car load lots the prices would be correspondingly higher, according to the heavier rate of freight paid from the mills to Toronto.

The usual terms are net cash thirty days from date of shipment.

Hoops for the wired hoop barrel, colored and grooved, are worth 25c. per 1,000 more than the above figures, but they have not come into general use as yet, only very few of the mills having adopted the wired hoop barrel.

WHAT IS A MUGWUMP BARREL?

THE barrel was nicknamed mugwump on account of its hoops. It is neither a flat hoop barrel nor a round hoop barrel, but half and half. For the barrel end, the hickory hoop is, no doubt, better than the flat one,

because it will stand pounding from the top without danger of breaking a great deal better than the flat hoop; but, on the bulge, the flat hoop is best, because it is a little larger and protects the barrels much better when they are piled up, by not allowing so much pressure on the staves.

UNITED STATES MARKETS.

COOPERAGE affairs in Minneapolis are quiet. But about one-half the flour milling capacity is now in operation, hence but about the same proportion of the flour barrel factory capacity is at work, and the market for flour barrel stock is correspondingly low. But the signs are all for a swift change in affairs, for at the opening of navigation, which comes immediately, there will be a stimulus given to the milling trade. Two of the cooper shops are crowded with work. The rest are idle.

There is a more active enquiry for dry stocks of staves, and a growing belief that the supply is not large. A few cars have been bought here, and the prospects are that a good trade is about to develop. Stocks on concrete are about exhausted, with such shops as have not yet renewed their contracts. It will be the policy of the shops to buy on the market this season as long as the market seems easy. The prices now are not below \$6.75 for dry staves, though for future delivery there are some lower offerings.

Heading is still held at 4½ cents. The greater part now used in this market is on contract with the members of the combine who are holding the price at the figures quoted, but all or nearly all the stock bought on the market is offered by concerns outside the combine at 4 to 4½ cents. It is thought that the stocks of heading are large, and that when the contracts expire in June the coopers will buy on the open market and force the price down to 4 cents or thereabouts. The weather has not been as good for the drying of stocks as was expected, so that both dry heading and staves are from two weeks to 20 days behind time.

The coiled elm hoop market is fairly firm at \$7 to \$7.25 a thousand, but there are a few offerings by small concerns below \$7. It is the belief of holders of this stock that a shortage is sure to develop not later than August, and that it will pay to hold on to stocks at this time. Hickory hoops are all off from any market price. It is a case of "save himself who can" with the holders of hickory hoops. They have been offered as low as \$5 to \$6 in this market. To our coopers who have paid \$7.25 for this stock steadily for years, these prices look demoralizing. There are scarcely any wanted even at this price.

Chicago reports as follows: The cooperage market is unchanged. Lard tierces are firm at 90c., and pork barrels at 70c. Receipts from outside very light, and only small stock on hand here. Dry staves are arriving slowly and are in good demand. No. 1 tierce, sawed, listed and dry, are quoted at \$20.50 to \$21, and No. 1 pork, sawed, listed and dry, at \$17 to \$18. There is also a good demand here for 24-inch and 19-inch cut-offs, at \$9.50 per M. for the former and \$7 to \$7.50 for the latter. Hoops have shown some strength since last month, and are quotable at about a dollar per M. higher. No. 1 oak tierce are salable at \$11 per M., and No. 1 pork at \$7.50 and \$8 in car lots. Headings about the same as last reported.

The report from Milwaukee, Wis., runs like this: "The past month has been one of the months that was unsatisfactory to the cooperage business. While no great improvement was made, yet there was more inquiry from out of town which usually brought an order of some kind or a promise. Considerable stock was received this past month and the trade is looking forward for a better demand this coming month. Staves and heading rule about the same figure, \$5.75 to \$6 for prime stock. Occasionally there are sales under this for off grade. The market for flour barrel hoops is a sick one and the offerings are largely in excess of the demand. The tight barrel trade shows no improvement as packers are not buying.

It is said that, on an average, one operation per day is made in New York for the removal of the vermiform appendix, the worm-like termination of the big intestine.

COOPERAGE PAST AND PRESENT.

IF we go back into ancient times, it is learned that the art of manufacturing barrels from staves dates back to the Romans, at the period of the Christian era. An old definition of the term makes cooperage consist of only what is made into barrels after they are completed, and classifies it tight-barrel cooperage, slack-barrel cooperage, and white cooperage, which is known as small woodenware, made usually of white wood. In the present day it is pretty generally understood that staves, whether rough or dressed, and heading in like condition, hoop-poles, shaved hoops, cut hoop iron, rivets for making hoops, hoop fasteners, hoop-keepers, clout nails, bungs, bung bushings, and, in fact, glue for making the inside of barrels for oil tight; all these, if found in a cooper shop, are classed as cooperage.

Writing historically of the cooperage business, Mr. B. F. Pratt, says in the Wood Worker: "There is, perhaps no industry that has risen and had its fall so rapidly as the manufacture of barrels. The absence of its use has brought about a shrinkage in the desirability for its use, because of the high prices it was driven to, and the consequent resort of the shipper to substitutes and selling his products loose. My earliest experience in re-coopering was the tar kegs made in a hurry and filled with hot tar, when a boy as a clerk in a country store which had the traffic in this merchandise over a large scope of country. An eastern Kentucky tar camp was usually run in those days by the members of a family going into the woods and taking a hand in its manufacture. After the kegs were made and a hole bored in the head to pour in the tar, the keg was filled and the hole plugged up with a corn cob. The kegs were withed together so that they could be swung across the "critter's" back, and the "old man," or his son or daughter, would mount another "critter" and the tar would be marketed, say two or dozen kegs at once, which was carried to town, the girl or boy who made the trip using a pack saddle to hold the kegs in place on one horse, and riding the other, either on a pack saddle or with no saddle at all. In this way very narrow roads could be traveled, and a trip could be made in a day and part of a night, a distance of fifteen to twenty miles. This was doing business within your means. No bank account was necessary; no entry clerk or book-keepers."

The petroleum oil business gave a great stimulus to the cooper's trade, afterwards to be reduced again from the fact that pipe lines were laid from the oil fields to the refineries; tank cars are now used; tin cans are made a great carrier of oils, lard, paints, tar, and some iron packages have been used to supplant barrels and kegs, and thus the trade in many different ways has had its ups and downs more so than many other departments of commerce.

FRAUDULENT BARRELS.

A FEW weeks ago, says a Boston paper, we alluded to how the buyers of turpentine in the north are defrauded by the manufacturers of turpentine barrels in the south, who make dishonest barrels, by inserting extra thick heads and staves, thereby making the barrel hold less than the gauge will show. Charles Richardson has handed us the result of the recent test made by him. He emptied five barrels, filling the same with water. Here is the result:—

Gauge of barrel.	Actual measurement.
53½ gallons.	50 gallons.
52½ " "	51 " "
50½ " "	48½ " "
51 " "	50 " "
49 " "	48 " "
256½ " "	247½ " "

A shortage of 6 gallons.

CLOCK OF BREAD CRUMBS.

ONE of the curiosities of Milan, capital of Lombardy, is a clock made of bread crumbs. It was made about 150 years ago by an ambitious workman whose time was not money. He had not the means to buy the metal necessary in the construction of the works, and so conceived the ingenious idea of taking his bread crumbs from day to day and solidifying them with a strong addition of salts, from which he constructed his clock.

AN AZTEC MILL.

A RECENT traveller in New Mexico sketches a picturesque mill which he found in an unfrequented spot. He says: "One day while riding across the country, we came to an old Mexican mill built thirty years ago. It is a primitive affair, and the grinding is done between two coarse stones propelled by a turbine wheel. The machinery is enclosed in a tumble down log hut, and is owned by an old Mexican couple who have long since ceased to derive any revenue from it. The man must be 70 years old, and his wife is probably but few years his junior. They were glad that we came and dug them out of their seclusion. The place is never visited by travellers, and their gratitude took on the inimitable



AN AZTEC MILL.

Spanish obsequiousness. The wife ran to the house and got the key and showed us the old machinery. Then she took us through her homely flower garden, where there are old-fashioned flags and hollyhocks and those flowers that old ladies of every clime like to cultivate. Though she apparently prized them very much, she cut a bouquet for us. Then the old man showed us his farm and fruit trees and market garden, much as a proud young Yankee would show us his treasure. The wife followed at a respectable distance, rolling a cigarette. When we offered her a little money for the trouble she had been to in showing us the mill, she received it with as much dignity as though it were a ducal ensign. One of the party gave her husband a cigar, but he passed it to his wife with a gay little shrug, explaining that she did the smoking for the family."

LONG VS. SHORT ROLLS.

THERE seems to be a growing disposition among British milling engineers to increase the length of rolls, and for small milling plants this practice has found favor with American engineers also, writes J. Myleys in the Australian Miller. Rolls of 18-in. to 20-in. length, looked upon as standard only very recently, are rapidly disappearing to make room for regular "giants" up to 40-in. long. It is claimed by the respective makers that a mill can be fitted at less cost if long rolls are employed; that the long rolls do comparatively more and better work than the short ones, and therefore prove more profitable for the miller all round. It certainly is a fact that the cost of fitting up a mill with, say, 40-in. rolls, is less than if 20-in. rolls were employed, for having to deal with less machinery, fewer belts and pulleys are required. Referring to the belts, however, the saving will be found very trifling indeed, for to drive one 40-in. mill nearly as many pounds of leather will be required as to revolve two 20-in. mills.

Regarding the work, however, it is utterly misleading to say the long roll will do more and better work than the short one, for practice goes to prove just the opposite; or, to say it better, two 20-in. x 9-in. mills will show better milling results than one mill 40 in. x 9 in., granted, of course, for both sets same conditions as to material to be reduced, speed, et cetera. This may seem incredible for any one not accustomed to the different machines, but it is, indeed, one of those cases where theory is not borne out by practice. Any pair of chilled iron rolls, no matter what length, show a greater reducing capacity in the end sections than in the middle, and the longer the rolls the more this fact becomes evident. Get the rolls ground as true as mechanical skill can do it, employ a feeding apparatus as complete as you possibly can procure it; yet your mill will produce softer stock on the ends than in the middle.

A certain Australian milling engineer, interrogated about this conundrum, solved it in this way: "The break roll grooves act like screws, drawing the feed toward the middle, therefore cramming the stock here, and leaving the end sections but half fed." Some say the rolls get bent by the action of the adjustment gear; others, again, blame the cog-wheel drive. Certain millers and engineers give it a point blank denial, blaming the feeding apparatus for the deception. Dealing with the Australian milling engineer's solving of the problem, is there time for the stock to travel any distance between the rolls? I for my part never could convince myself of its being so by practical tests, for I don't take into consideration that condition where a mill is overfed, and the rolls don't deliver as quickly as the feed is piling up between them. Under ordinary circumstances any miller may try the experiment. Drop small shavings along with the stock, watch the point where they will be ejected, measure the way they have been drawn toward the middle. I never could manage it—even in an overfed mill I failed to see any screwing action; the stock keeps rolling over, but not travelling either way. Why should the grooves, running over the whole length of the rolls, act like left and right-handed screws meeting just in the middle? That theory neither seems logical nor is it proved by practice. If the theory were right, the stock ought to be screwed along the whole length of the rolls, and not from both ends into the middle; and practice makes quite evident the scissors-like action of the grooves.

We find the defect in smooth mills in a by far more marked degree, yet here there are no grooves to do the screwing. What, then, is the reason of the deficiency? Further, the engineer referred to said: "The stock is cramming toward the middle, leaving the end sections but half fed." This again does not seem feasible, calling the practical test to your help. Regulate a mill as even as you can get it, catch the stock, feeding the end sections, say 4 in. each side, for about a quarter of an hour—viz., before and after passing the rolls; do the same with 8 in. of the middle part, and compare results; they will be almost alike. Again, block the feeding apparatus of a mill running on dunst for about 4 in. each end, so as not to feed here at all; set the mill as true as possible, and let it run in this way for a couple of hours. It is necessary to do so for reasons given later on. Here we find the end sections but imperfectly fed, and the middle crammed; but the reducing action of the ends is found imperfect; the stock throws the rolls apart, and opens the end sections as well, passing the thin layer of stock hardly touched. As said above, to try the experiment the rolls want to be well set—one side to get as much pressure as the other, else the rolls run hard together on one end, diverging from each other as length increases.

As to the bending of rolls, is it imaginable ordinary milling work can bend a 9 in. or 10 in. chilled iron column? Why don't the rolls bend, as long as they are cold? Start a long mill, being perfectly true and level, besides having stopped for a night, it will do its work as well as any short roller; overhaul this machine again in about two hours' time, and it will soften better in the end sections than in the middle. So there the rolls bend as soon as they get warm. Let him understand this who can. Should not the continual friction and dislocation of the small iron crystals forming the roll make the metal brittle enough in time to crack the roll through the middle? If you think of a smooth roll revolving about 1,500,000 times in six days' work the bursting should not be unlikely at all. We have seen cracked porcelain rolls, but I never saw, heard or read anything of chilled iron rolls failing in this way.

The cause of the evil is, from my experience and in the opinion of many practical millers, not to be found in any of the causes dealt with. The radiating heat of the bearings, also the heat developed by the friction between the rolls and stock, expands the rolls unevenly, and the same power that generally cracks the porcelain roll, I should suggest to blame for the defect found in chilled iron rolls. There is one reason at least why the end sections of rolls will always expand more than the middle part, and therefore show different reducing results. Chilled iron rolls are cast solid in many cases, the steel shafts being forced in by hydraulic pressure. Some manufacturers cast the rolls hollow, but allow iron enough in the ends to carry the shaft; but very few rolls are manufactured like shells,

ends and shafts being fixed similar to those in Wegmann's Porcelain Rolls. However the rolls are made, the end sections must be the closest-grained parts—consequently, when warmed must expand most. This seems to be verified by the working of rolls. Softening more in the end sections, one would feel inclined to think those very parts should wear down and bring the roller face to a level, so to say, but that is not the case; on the contrary, the longer the mill is at work, the more hollow it gets. The end sections expand most, yet, being of closer texture, stand the wear better.

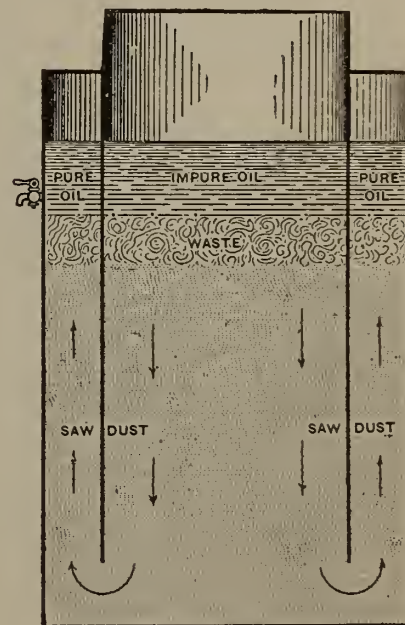
Through bad adjustment, sometimes one end of a mill will run closer than the other, and not being noticed for some time, the bearings will get hot. The quickest way to remedy the evil will be the opening of the rolls; kept going in this way, the bearings soon are cool enough to warrant the setting of the mill afresh. Here, again, the rolls have been expanding all the time, radiating the developed heat through the shafts to the bearings, besides forcing a higher pressure upon them.

The engineer referred to above had once ground for me a 30-in. x 10 in. mill smooth. The job not being finished to my satisfaction, I showed the man the rolls set tight in the frame. He would not credit the rolls were not done true. I convinced him of it by showing the streak of light that could be perceived for about 6 in. in the middle. Taking some very thin tracing paper, he tried whether the rolls would bite it right along. They did so, indeed; cut the paper where the rolls covered each other, and held it tight where you perceived the streak of light. The man was satisfied with this experiment, for he argued: The fault is so diminutive the mill must work. To his great surprise he found it did not work, at least what you may call satisfactorily. Where you saw light through the rolls the stock passed almost untouched. The expansion, again, was the agent to bring this about, to the greatest surprise of the engineer.

Whether I am right or wrong with the expansion theory, I don't know. In any case, I am quite satisfied that short rolls have a better reducing efficiency than long rolls.

HOME MADE OIL FILTER.

A CORRESPONDENT of Power gives the following description of a home-made oil filter which he has found to work successfully: It is made of an old oil can that will hold about 40 gallons. Inside this is placed a galvanized iron or tin tube, raised from the bottom by a couple of sticks and projecting about six inches



HOME-MADE OIL FILTER.

above the top of the can. The can and tube are then partly filled with clean sawdust, with a layer of waste or cloth on top, as indicated in the sketch. The impure oil is poured into the tube, filters down through the waste and sawdust and up again in the can, whence it may be drawn off through the cock as needed. By pouring in a few buckets of hot water first, you have a water filter for the oil, as it will pass through the filtering material in the same way. I have made two filters in this way, at slight expense, and they work all right.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

NAMES OF FLOURS.

EVERYONE is familiar with the oft-quoted words of Shakespeare, that a rose by any other name would smell as sweet. This is the case where the poet, perhaps, was a little astray. In business a name has much to do with success. We are not going to moralize, however, and talk of the necessity of a business man bearing a good name, and how far such goes as capital in the management of his business. All ought to understand this.

We are thinking just now of a name as representing, probably, the trade-mark of a concern, used in the case of the miller as a brand of the flour produced. Not long since in these columns we had occasion to point out to what extent sometimes a well-known brand was prejudiced by the dishonesty of some unprincipled miller, who would steal a good name and apply it to an inferior quality of flour.

There is another thought in connection with the names of flours, and it is the multiplicity of them among individual millers. We take up the letter heading, or business announcement, of almost any miller throughout the country. We find that he is producing a variety of flours, as far as distinctive names are concerned, that must keep his mill busy, making sure that there is sufficient stock of each brand on hand to meet the calls of his customers. Is this not a mistake? A study of the world's commerce shows that the men who have got hold of an article of genuine merit, baptised it with some catchy-name, and rung the changes on this by judicious advertising methods from year to year, and decade to decade, are the ones who have made the most money. There is nothing like familiarizing the people with the name of an article, and the article once firmly established and kept constantly before the people, secures a grip on their confidence that is difficult for any rival to take away from them. Let the miller have sufficient variety of names to cover the leading grades of flour that he may manufacture, and then his aim ought to be to let the people know that these particular flours, as bearing the names chosen, have no equal anywhere.

Touching on this matter of names or trade-marks, our notice has been drawn to some remarks on the question in a late issue of Milling, where the writer comments on the similarity flour brands or trade-marks bear to each other. Certain familiar symbols appear over and over again. The star, the anchor, and designs of this class, with sufficient modification to make the designs differ one from the other, are adopted by our millers. Then the craze is for words of like character, such as, "snow-flake," "white lily," "crown jewel," "gold dust," etc., whilst every miller makes, of course, "choice," "standard," "best," "superior" or "extra," flour. This method of branding flours has been adopted to so wide an extent that we would think there was a good place for an ingenious advertising writer to strike on an entirely new line of thought, and catch a good business from some enterprising miller who wanted to be a little more original than some of his brothers.

The town of Mattawa, Ont., has decided to grant exemption from taxation and a bonus of \$2,000 for the erection of a grist mill at that place.

OBSERVATIONS.

AN explanation of the slackness of local flour trade in some sections of the country, is explained by the fact that farmers have had abundant supply of potatoes in their cellars, and they have been feeding on these rather than bread, fearing that they would rot on their hands.

It is quite plain to anyone who studies with care the very unsettled condition of the flour market, that all sorts of explanations are in order in interpreting the situation. Just how low flour has been selling in England is known to every miller, and we are told by one authority that the cause of this is that English millers are making up flour from Russian wheat of an excellent quality, and which is bought at a price that discounts even the very low prices that North American wheat is now selling for.

MR. C. K. GRAHAM, of Belleville, who has recently returned from a business trip to the West Indies, gives quite an encouraging account of the possibilities of trade in those colonies. He had been doing business on behalf of Canadian woollen mills and reports a good trade. For products like cheese, butter, canned goods and even potatoes and onions there is a good business. In the reports that we have seen of his remarks no particular mention has been made of the flour trade, but from what is already known of the flour business in the Indies, when Mr. Graham speaks favorably of the generally healthful tone of business in those parts, we have reason to believe that Canadian millers need only to keep their products well to the front and they will obtain as good a market, relatively, as other products, which Mr. Graham has been handling.

OATMEAL millers felt that they were badly treated when the new tariff was announced, leaving the duty on oats at 10 cents per bushel, while that on oatmeal was reduced from 1½c. per pound to 50c. per barrel. The effect of this would be, according to a view expressed by Mr. John Wright, oatmeal miller, of Owen Sound, to enable American millers when their oats were low-priced to send their meal into the Dominion, while, if a Canadian oatmeal miller wished to import oats to keep up his trade it would cost \$1.00 to a \$1.10 to do this, as it takes from 10 to 11 bushels of oats per barrel of each according to quality of the oats. In Parliament on the 20th inst., however, in committee of Ways and Means, the tariff resolution being under discussion, Mr. Foster changed the proposed duty on oatmeal from 50c. to 68c. a barrel, with the view, he said, of equalizing it with the duty of 10 cents a bushel on oats. The proposition brought a vigorous protest from Sir Richard Cartwright and others, but was finally passed.

ENGLISH milling journals are giving a large amount of space of late to a discussion of the character of American flours that are being sold in that country. With a certain class of writers there is hardly anything too strong that can be said against American flours. Reading these articles one can come to no other conclusion than that Americans are making the worst class of flour for the purpose of exporting it to Great Britain. There is reason to believe that there has been a considerable quantity of flour of a very poor quality sent from the United States to the old country, and this has done a heap of prejudice to the product of the flour mills of this side of the Atlantic. But when a general onslaught is made on the characters of the flour producers of this continent, we have an object lesson, showing just how far prejudice will carry even common-sense people. The British and Foreign Confectioner and Baker seems to have taken a fair and impartial view of the situation when in a recent issue it remarked of American millers: "If they are not all as honest as they should be, we are at a loss to know where to turn to find much better. We are not always sure of the honesty, even of the British miller, the one is, perhaps, as easily watched as the other." It is the common mistake to denounce whole classes of people, because of the misdoings of a certain section of this people, and this is where our English milling writers seem to have erred.

A flour mill is being built at St. Henry Mission, Fort Vermillion, N. W. T.

WHEAT TO GO TO TWO DOLLARS.

DON, of Saturday Night, by way of diversion, we suppose, has dropped his weekly homilies on politics, morals, and society affairs, for the nonce, and taken to commerce. In a late issue of that journal he publishes an interview with Mr. Van Horne, of the C. P. R., which is rose-colored in its predictions of the good things in store for Canada in the near future. Mr. Van Horne said:

"I have asked a dozen men high up in railroad and speculative affairs in the United States to tell me what the wheat product of the world is, and I have never found one who knew. Of course it is part of my business to understand something about wheat and its future, as the C. P. R. depends so largely on the success of wheat-growing in the North-west.

"By the way" have you any idea what the wheat product of the world is?

"Say, you fellows write very sagely on the price of wheat, and yet I have never met one of you who knows enough about it to really make your opinion worth much. Of course it is difficult to get any accurate statistics, but as far as I have been able to find out after a careful scrutiny of everything that is provided in a statistical way, the world's product of wheat is between twenty-three and twenty-four hundred million bushels per annum. I have been unable to find any trace of seed wheat being taken into consideration; this I reckon at about three hundred million bushels, bringing the total annual product of wheat up to between twenty-six and twenty-seven hundred million bushels.

"Of course the wheat-producing area is being continually enlarged, south Africa and Argentina, for instance, but their total output is so small an item in such large figures that it is more than offset by the fact that millions who used to eat rye bread are now eating wheat bread owing to the decreased price.

"Last year the raisers of wheat at best received little better than the cost of producing, while in many instances their return per bushel was smaller than their expenditure. This can have only one effect, the discouragement of the wheat producer and consequent decrease of the acreage.

"Now if there is a decrease of ten per cent. in the production of wheat this year, owing to the low prices of last year, there will be a shortage of two hundred and seventy million bushels, and ten per cent. of a decrease is well within the mark. As far as I can remember, there has never been a surplus of a hundred and fifty million bushels.

"This year the surplus has been used up by feeding it to the stock, and we will probably start in with as nearly a clean sheet as ever before. Now, if there is a shortage of only a hundred and fifty million bushels, this will not be discovered until it is too late to sow more wheat, and wheat will go up with a jump.

"Even one year of higher-priced wheat will not bring back the old acreage, and for two seasons no doubt there will be a large advance, and within eighteen months I expect to see wheat two dollars a bushel.

"Why," said he, "when I was in the railroad business in the southwest I remember when the farmers of Illinois produced so much corn that the price went down to six, seven, eight and nine cents a bushel, and was used for fuel, burned like coal, in the central Western States.

"People said, 'Oh, corn will never come back to its old price; there is too much of it grown.' Next year it was over forty cents a bushel, and has never gone back to anything like a ruinous price, though the production has been multiplied a hundred times."

"It will be the same with wheat; the re-action will come and it will mean astonishing prices. If the re-action comes the Northwest will get the benefit of it. It raises the best wheat in the world, and in spite of the fact that the C. P. R. is charged with exacting exorbitant freight rates.

"I can tell you that we haul wheat from the North-west to the seaboard more cheaply than it is carried the same distance anywhere else in the world. Why, in Australia, where they are beginning to raise wheat for export, they pay as much freight for a hundred and fifty miles of transportation as the Western farmer pays the C.P.R. for fifteen hundred miles of haulage. Talk about Russian and Indian wheat, South American wheat! None of them get to the seaboard as cheaply as the wheat of the Northwest."



Office of the CANADIAN MILLER,)
April 23, 1894. }

THE GENERAL SURVEY.

INTEREST in the markets during the month has gathered, largely, around weather conditions, and prices have been affected according as these have been favorable or the opposite. This was seen quickly after the publication of the United States government report for April, on 10th inst. In fact, before the report had been published, speculators had, in anticipation, sent the price of May wheat up to 66½¢. The story had been circulated that the damage to crops was considerable, but when the official document was published it was found that winter wheat throughout the Union was nine points over the condition for the same time last year. The result was that the market soon dropped again after this to 58½¢, a decline of almost eight cents a bushel.

Some uncertainty, however, has existed as to the real import of the government report, which was in these words: "The returns in regard to the effects upon wheat from the recent cold spell are not so conclusive as is desirable. The injury to the crop is undoubtedly considerable, if not great, but the comments of correspondents accompanying the reports would seem to indicate that the full extent of the damage was not fully determinable at date of transmission." The Price Current, of Cincinnati, has offered this comment: "The improved condition of winter wheat reported by the Government plant offsets the decreased acreage of 7 per cent, reported in the December statement, and with normal conditions for the remainder of the season a yield equal to last year may be expected." There is reason to hope, even though the crop reports have not let us entirely out of the woods, that wheat prices will continue firmer. These conditions are noticeable in the Chicago market where a stronger feeling now exists, subject at same time to some fluctuations, and a sympathetic feeling of buoyancy has found a place in both Ontario and Manitoba.

Referring again to the report of the Secretary of Agriculture at Washington, the following statement, specially called for by resolution of the Senate, and indicating the visible and invisible supply of wheat, will be found interesting just at this time. The minister says: "The total supply on March 1, 1893, was 610,000,000 bushels. Exports from March 1, 1893 to March 1, 1894, consumption from March 1, 1893, to March 1, 1894, amount in farmers' hands March 1, 1894, and visible supply, March 1, 1894, amounted to 729,000,000 bushels, which is given as the total amount distributed and available for distribution. The apparent discrepancy is 119,000,000 bushels. The supply on hand March 1, 1894, was 190,000,000. The probable consumption from March 1 to July 1, 1894, is 121,000,000 bushels, leaving 69,000,000 bushels available for exportation from March 1 to July 1, 1894."

Late official reports from Russia, so far as they can be relied upon, tell of favorable weather conditions in that country. In some places excessive humidity is complained of, chiefly in the provinces of the Baltic and Poland, but generally the outlook is encouraging for a good crop. What a large crop means for Russia and its relations to the wheat-growers of Canada, may be better understood, if for a moment we consider the place Russia is fast occupying as a chief provider of wheat for the United Kingdom. Dating from 1st. of last August to the early days of March of this year, that country shipped 78,872,006 bushels to Great Britain, whilst the shipments from Canada, the United States and the Pacific coast, were only 61,412,000 bushels. Taking this view of the situation into account, and remembering that with cheap labor and lower freights in her favor, she is likely to become a still more potent factor in the future, it would appear as though at a comparatively early day we might expect wheat prices to be fixed abroad, and not from this side of the Atlantic. The situation is made further complex when we recognize the position of the Argentina and India, as wheat growing lands, whose position is rapidly becoming strong.

The Mark Lane Express, in its weekly review of this date, of the British grain trade, says: English wheats have been quiet, and foreign wheats a trifle lower. California has sold for 25s 3d a quarter; fine hard Manitoba at 25s 9d, and No. 2 red winter at 23s. Corn has been steady, mixed American fetching 17s 6d a quarter. Barley and oats have been firm, and beans sold 6d lower. English wheats have averaged 25s 5d. In fore-

ign wheats American reds obtained full terms. Flours are without demand, and corn is slow at 3d decline. Oats are quiet. Barley dull, and beans and peas are held for an advance.

The following table shows the quotations per central at Liverpool, to-day 23rd, inst., as well as for the five preceding days. In the case of wheat highest prices are given.

	April 17, 12.30p.m.	April 18, 12.30p.m.	April 19, 12.30p.m.	April 20, 12.30p.m.	April 21, 12.30p.m.	April 23, 12.30p.m.
R. Winter.....	S. D. 5 0½	S. D. 5 0½	S. D. 5 0½	S. D. 5 0½	S. D. 5 0½	S. D. 5 0½
Cal. No. 1.....	5 2	5 2	5 2	5 2	5 2	5 2
Corn.....	3 10¾	3 11	3 11	3 10¾	3 10¾	3 10¾
Peas.....	4 11	4 11	4 11	5 0	5 0	5 0
Pork.....	70 0	70 0	70 0	70 0	70 0	70 0
Lard.....	40 0	40 0	40 0	40 0	40 0	40 0
Bacon, heavy.....	33 6	33 6	33 6	34 0	34 0	34 0
Bacon, light.....	35 6	35 6	35 6	35 6	35 6	35 6
Tallow.....	25 6	25 6	25 6	25 6	25 6	25 6
Cheese, wh.....	58 6	58 6	59 0	59 0	59 0	59 0
Cheese, col.....	58 6	58 6	59 0	59 0	59 0	59 0

Beerbohm, London, Eng., says: Floating cargoes—Wheat, weak; corn nil. Cargoes on passage—Wheat, steady; corn, slow. Mark Lane—Wheat, English, quiet; foreign, steady; corn, quiet; flour, slow; spot No. 2 Calcutta wheat, unchanged; present and following month 3d higher; Plata wheat, off coast, unchanged; present and following month, 3d higher.

Later, 4.30 p.m.—Antwerp—Spot wheat, quiet; red winter, 13f 87½¢ was 13f 75¢. Paris—Wheat and flour, quiet; wheat 20f 40c, was 20f 50c for May; flour, 43f 20c, was 43f 10c for April.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—White selling in limited quantities at 60c; red and white, middle freights west, 58c; spring wheat on Midland, 58c; goose, 58c; Manitoba: No. 1, hard, 73c; No. 2, hard, 71c. The Trade Bulletin of Dominion Millers' Association reports Toronto wheat, 64c. on track for fall wheat, and Ontario wheats; car lots, fall wheat, 58c., holder asking 58c. to 60c. straight for fall, and 60c. to 61c. for spring. Montreal: Prices are fairly steady; No. 1, hard, Manitoba, 79c. to 80c.; No. 2, 75c. to 76c. Chicago: Wheat dropped at this writing a cent for May, and a cent for July. Futures closed: April, 57½¢; May, 57½¢; July, 60¼¢; September, 62¼¢. Duluth: No. 2, hard, 61½¢. for May; 63½¢. for July; No. 1, Northern, 60¾¢. for May; 62½¢. asked for July. Toledo: 57¾¢. for cash and April; 58c. for May; 60¾¢. for July; 61½¢. for August. St. Louis: 54c. for cash; 53¾¢. for April; 53¾¢. to 53¾¢. for May; 56¼¢. to 56¾¢. for July; 57½¢. bid for August.

BARLEY—Toronto—Best malting barley is now on a par with feed prices, the latter having advanced. No. 1, west, 41c. United States malsters are buying slowly, whilst a considerable demand exists for feed.

OATS—Toronto—Sales steady. White, west, 33½¢; odd sales are quoted at 34c. Montreal: No. 1, in store, 40c. to 41c. Buffalo: No. 1, white, 40c.; No. 2, white, 39c.; No. 3, white, 38c. Toledo: 34c. for cash.

PEAS—Toronto—Quantities have been bought on speculation for export. Prices are firm. Exporters bid 55c. for C. P. R. and G. T. R. lots west. Holders are asking 56c. to 57c. Montreal: No. 2, 39½¢; No. 2, delivered, 40½¢; No. 3, 39c.; No. 2, white, 41c.; No. 3, white, 39¾¢; track mixed, western, 39c. to 40c.; track white, western, 40c. to 45c.

RYE—Toronto—On Midland, 46c. Value for export, 51c. afloat Montreal, or 46½¢ at east lakeports. Montreal: 52c. to 53c.

BUCKWHEAT—Toronto—Little doing. Car lots quoted at 40c. to 41c. Montreal: 45c. to 48c.

THE FLOUR MARKET.

Low prices continue to be the rule with flour, and the volume of trade does not materially increase. In country sections local mills are doing probably as satisfactory trade as can very well be expected and we do not know but what their position is a better one than that of some of the larger mills. In export trade we have learned of good shipments to Newfoundland. One case is reported from Montreal of a sale of 2000 barrels of straight roller flour, though the price is said to have been exceptionally low. The Montreal Trade Bulletin says: It is estimated that 25,000 to 30,000 barrels of flour have been awaiting opening of navigation, of which about 12,000 barrels are said to be American. A commercial journal, published at St. John's, Newfoundland, states that flour remains the same price in all grades with no appearance of a change for some time to come.

PRICES OF FLOUR AND MEALS.

TORONTO.—(Toronto freights)—Straight roller, \$2.55 to \$2.90. The Trade Bulletin of the Dominion Millers' Association, reports of Ontario flours: "Sale of straight

roller, \$2.70 and 90%; Patents \$2.90 and 80%; Patents at \$3.05 f.o.b. for Lower Provinces. Bran, \$14.75, \$15 and \$16. Shorts, \$15.50 and \$16 f.o.b. Export market, no sales reported.

MONTREAL.—Patent winter, \$3.40 to \$3.60; Patent spring, \$3.60 to \$3.70; straight roller, \$3 to \$3.10; extra, \$2 to \$2.80; superfine, \$2.50 to \$2.70; strong bakers' \$3.50 to \$3.60. Ontario bags, 1.35 to \$1.40.

NEWS AND NOTES.

CANADA.

—Mason & Borin will operate a grist mill at Magog, Que.

—Wm. W. Smith will operate an oatmeal mill at Portage la Prairie, Man.

—Melita Milling Company, Ltd., Melita, Man., J. S. Ferguson is dead.

—D. Goldie, of Ayr, intends this summer to enlarge the capacity of the Greenfield flouring mills from 400 barrels to 700 barrels per day.

—Ralph Kidd has purchased the whole interest of J. & R. Kidd, millers, Tilbury Centre, Ont. It is the intention of Joseph Kidd to build and operate a mill at Prince Albert, Sask.

—The Ogilvie's and Lake of the Woods Milling Company have closed down their elevators at Thornhill, Man. 200,000 bushels of No. 1 hard wheat were marketed at this point the past season.

—The McKay Milling Company, Ottawa, Ont., have closed down the night watch in the Chaudiere Mill for the present, throwing about twenty hands out of employment for the present. The mills have not been running regularly for some time past, having on hand an overstock of flour.

—The Municipal Council of Vernon, B.C., have accepted the offer of W. E. Ellis, of Fenelon Falls, Ont., to build a 50-barrel flour mill, the municipality granting a bonus of \$5,000, a free sight and exemption from taxes for 10 years, and are also to give the exclusive right to supply the electricity required by the town for 10 years.

—The case of Leon M. Carrier, the defaulting grain man, is before the courts at Quebec, this week. Among the witnesses are a large number of flour merchants who are being called to prove that in their opinion the cars were delivered when placed on the spur line opposite their store and their name checked on them. Full particulars of the nature of this case have already been given in these columns.

—"We are on the outlook," said Reeve Fowler, of Wawanesa, Man., "for a man with money to invest in a good roller mill. We offer \$5,000 of a bonus, a free site, and a switch into the mill. There is no flour mill within a radius of twenty miles, and at the various elevators in the neighborhood last year about half a million bushels were marketed. If the prettiest location and the best wheat country in the province are any inducement," continued Mr. Fowler with enthusiasm, "why we've got that to offer."

GENERAL.

—During the year ended with July, 1890, France imported 34,625,572 bushels of wheat and flour, against 45,731,576 bushels in 1891, against 112,840,000 bushels, in 1892, and 39,240,000 bushels in 1893. During the first seven months of the present crop year the total was 43,928,000.

—Two of the largest flouring mills in St. Louis closed down a few days ago ostensibly for the purpose of making repairs to machinery. It is reported that nearly every flouring mill in this district will close down for an indefinite period. It is set forth that there has been an over-production of flour, and this, in addition to the low price of flour, makes it necessary for the mills to close down.

—Reports from Chicago say the grain fleet commenced leaving there on April 1, being ten days in advance of the opening last year. There is a great contrast in the business. Last year, with a good prospect of good freights and return loads, there was a great rush of vessels to get away. This year their is a little freight to be moved, at low figures, and when most of the boats reach the lower lakes there will be little for them to do but to lay up till business improves.

PERSONAL.

Mr. W. F. Swanton, head miller in Ogilvie's mill, Winnipeg, has resigned his position, and it is said, will take up his residence in Minneapolis.

Mr. Alick Smith, head miller in McIlroy & Gemmell's roller mills at Richmond, Ont., has accepted a similar position in their mills at Carp. Mr. Archie Gemmell takes Mr. Smith's position.

VIEWS AND INTERVIEWS.

A Queer
Year.

Probably every period of time is marked by some peculiar phenomena. Certain great events, or the rise or fall of some prominent individual, marks an epoch of time. In the commercial world there have been many of these remarkable periods. Black Friday is travelling through the ages of commercial history. The bursting of the South Sea bubble has become an event that makes history incomplete without its telling. In later years there has been the Credit Mobilier, that blackened the name of men like Schuyler Colfax. The recent financial failure of that great Frenchman De Lesseps is fresh in the memory of everyone, even yet. Directly in the line of the grain and milling trades the past year goes on record as marking a sudden and continuous drop in prices, such as the trade had not seen for years. Take the year throughout, so far as these trades are concerned, it has been a queer year. Oats, usually looked upon as an inferior grain, have brought as good a price as wheat, pound for pound; and apples have sold at a higher figure than oranges, peck for peck. The hog had been fattened to be killed, and that is where the profit is supposed to come in, but all winter through hogs have been worth more alive than dead. Middlings and feed, the off-scourings of wheat, have sold for more than wheat. And so we might continue the chapter of trade anomalies that have been witnessed throughout the year. No wonder people ask: Are the times out of joint?

The Gain of Dull
Times.

Busy times, no matter how much we may desire them, are not all gain. It is true that at this period many matters that call for careful attention are sadly neglected. Everything is hurry and turmoil during the days of a roaring business. One thing crowds another in quick succession, and we neglect many things. The dull times give us a chance to pick up, and they may be accepted as blessings in disguise. On these lines a writer in *The Roller Miller* reminds us that it is during just such times as we have experienced for a year past that a fitting chance is given the miller "to do the hundred and one things which for years, it may be, he has been putting off to some more convenient time. There is first of all that detailed plant of the mill, floor by floor, machine by machine, shaft by shaft, and belt by belt, to be drawn in duplicate, one copy for the office and one to keep at home, against a possible day of reckoning with the astute fire insurance adjuster. There is a better arrangement or connection of machines, long talked of but always deferred. There are those small repairs the neglect of which has maintained so many little leaks to get in their evil work on the year's balance of profit or loss. There is the new machine or system or process that can now be studied at leisure. There is the question of further economies in manufacture or disposition of product. There is the subject of possible new fields for trade, which can now be taken up deliberately. On the miller who rightly considers these things dull times confers an opportunity the value whereof is expressible only in terms of gold."

India As a Wheat
Competitor.

So much has been written of late of India as a wheat competitor that we are generally taking it for granted that she occupies a formidable position in this respect. We do not know that it is safe to belittle her position; at the same time the nearer we can get to facts in the matter the better. Mr. J. R. Dodge, in *The Cincinnati Price Current* of a few weeks ago, discusses this question. We, in Canada, as a wheat growing country, are much interested in the subject. India, we are told, has now about the same breadth as 20 years ago. Mr. Dodge's own words are these: "The normal wheat acreage for years prior to 1874, as stated by the most reliable statistical writers upon India, was, 26,000,000. About that time in the progress of commercial enterprise following railway extension, there was a revival of interest in wheat growing, and in the course of ten years the conservatism of growers did yield sufficient to add 2,000,000 to the normal aggregate. Then many of the commercial journals of this country

became alarmed at the prospect of the loss of our wheat trade. I saw that the Indian wheat movement had reached its limit, and prophesied a reduction of both acreage and exports, and was criticised in some quarters for the opinion, but the decline promptly set in. In 1887 I discussed Indian wheat prospects with Sir James Caird at his residence in Sendon. He had been an Indian finance commissioner, and was an eminent agricultural expert. He indorsed fully my views as to Indian wheat growing, as did Professor Wallace, of Edinburgh, afterwards. The present acreage is reduced to the normal breadth of long ago, and there is no immediate danger of further Indian competition."

Rip Van Winkle
Methods.

How far, it may be queried, will the following story from an English source, find an application to Canadian milling methods: "Once in the Foreign Office a new chief was taking possession of his rooms, and he came face to face with a soldier, pacing the passage. He marvelled because the guard gave the word: 'Keep to the left.' 'Why do you say: 'Keep to the left?'' 'I don't know.' The statesman investigated the singular affair, and, after not a little trouble, a clue was found and followed. It seems that fifty years previously the passage had been painted, and an orderly had tramped it with orders to bid everyone to 'Keep to the left,' and avoid the wet paint. This order had stood unchanged and practically unquestioned for a term of fifty years." This man, probably, had a reason for the faith that was in him, but it was a poor reason. We are all familiar with the story of the farmer who always sent his lad to the mill with a bag of grist thrown over the back of the donkey, the product in one end and a large stone in the opposite end, the one to balance the other. He might have divided his grist in half and accomplished the same purpose and saved loading up the jack ass with a double weight. But a suggestion to this effect from the lad was indignantly resented by the father. He had gone to the mill after that fashion, and his father, grandfather and great grandfather before him had done so. Why change now? It was the case of

Not to reason why,
Their's but to do or die.

But the business man who goes on this Rip Van Winkle line is going to be left in the race of business, sure.

STRENGTH AND YIELD OF FLOUR.

WILLIAM JAGO, chemist to the national association of British bakers, who visited this country in August last, for the purpose of making an analysis of the various grades of flour produced on this continent, is publishing in installments a report of his investigations. Writing on the question of strength and yields of flour in one of these reports, he says:

"The word strength is used in the sense of a measurement of the capacity of the flour to produce a bold and full-volume loaf. This capacity is, no doubt, due to the quantity of albuminoid bodies present, and also to their character. The universally employed test for this purpose is the extraction of the gluten of the flour and determining its quantity, and, second, forming some opinion of its quality. In determining amount the writer prefers to prepare a dough from flour mixed with 50 per cent. of water, and thoroughly kneaded until perfectly smooth in a Pfeleider machine; 15 grams of the dough are at once weighed off and allowed to stand in a glass of water for one hour. At the end of that time the gluten is extracted by washing in successive quantities of water at 70 deg. F. until the last water receives just a trace of milkiness, and gives only the slightest reaction with solution of iodine. The exact point can only be determined with practice, as some of the glutens begin to dissolve before the whole of the starch disappears. Each lot of washing water is passed through a sieve, and any stray fragments of gluten thus recovered. The gluten is pressed as dry as possible, and weighed and registered as 'wet gluten.' It is next allowed to stand in the fresh air till the next morning, say fourteen to eighteen hours, and its condition observed; that is, whether still fairly firm and elastic or 'runny' and flabby. Its character at the expiration of this time affords valuable indications of

the general quality of the gluten. Unfortunately no means exist of giving a numerical register or determination of the judgment formed on this basis. The gluten is next dried until the weight is constant in a hot-water oven. This takes approximately thirty-six hours; if weighed at the end of twenty-four hours the results are, in any case, about 0.25 per cent. too high. The weight thus obtained is termed 'dry gluten.'

"The yield necessarily depends on the inherent moisture of the flour and also its capacity for absorbing water and retaining the same throughout fermentation and baking. The percentage of moisture in each sample of flour is given; but it is probable that owing to the hygroscopic nature of flour, all have absorbed more or less moisture between collection and analysis. To ensure accurate moisture results, flour should be kept in absolutely air-tight vessels. The doughing test, by which the stiffness of dough from measured quantities of flour and of water is judged, affords a means of estimating the water-absorbing capacity of a sample of flour. In the following tests doughs are made with one and a half ounces of flour and water measured in units, each of which equals the quart to the sack of 280 pounds. The stiffness of the dough to the hand is observed, and then the dough is tested at the expiration of an hour in the writer's dough viscometer—an instrument which mechanically measures in a registerable form the viscosity (combined rigidity and toughness) of the dough. The figures obtained are the number of quarts of water per sack necessary in order to produce a dough of arbitrary viscosity. That selected as a standard is the one best fitted for readings with an instrument of this kind, and is, with strong flours, about the consistency of north-country tin-bread dough. Its essential use is the obtaining results which are independent of individual judgment and capable of numerical expression. It may here be incidentally mentioned that a prolonged experience of this instrument has led the writer to the opinion that as at present constructed it is more sensitive to tenacity than rigidity. A stiff dead dough from weak flours runs through proportionately more quickly than a comparatively slack one from hard, strong flours. The possibility and advisability of endeavoring to so modify the instrument as to increase its sensitiveness to actual stiffness as distinct from tenacity is at present under the writer's consideration.

"The water-retaining power of flour can only be definitely judged by following it through fermentation and baking, and in respect of these it is difficult to make exact comparisons between tests made respectively on the large and small scale."

HORSE POWERS OF SINGLE LEATHER BELTS.

NO one can tell at sight what a leather belt will drive; almost anyone knowing the width, thickness and speed, can figure it out in a minute. This table is to save figuring; and is correct for belts 7/32 inch thick, in good condition, wrapping half way round cast iron pulleys, and joined by single leather lacings.

The rule by which it is got says "the horse power is equal to the width in inches multiplied by the speed in feet per minute and divided by 650." Thus a ten inch belt at 2,000 feet a minute should be good for (10 x 2,000) divided by 650, equals 30.77 horse power; a 20 inch belt at 2,500 feet, for (10 x 2,500) divided by 650 equals 76.92 horse power; and so on.

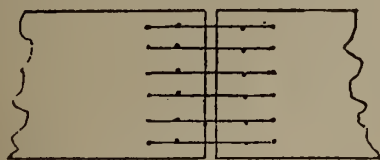
This table is for leather belts in good condition, wrappings 180° on cast iron pulleys, and joined with single leather lacings:

WIDTH INCHES.	BELT SPEED, FEET PER MINUTE.									
	1000	1250	1500	1750	2000	2250	2500	2750	3000	
1	1.54	1.92	2.31	2.69	3.08	3.46	3.85	4.23	4.62	
2	3.08	3.85	4.62	5.38	6.15	6.92	7.69	8.46	9.23	
3	4.62	5.77	6.92	8.08	9.23	10.4	11.15	12.7	13.8	
4	6.20	7.70	9.20	10.8	12.3	13.8	15.4	16.9	18.4	
5	7.69	9.62	11.5	13.5	15.4	17.3	19.2	21.	23.	
6	9.23	11.5	13.8	16.2	18.5	21.	23.	25.	28.	
8	12.3	15.4	18.5	22.	25.	28.	31.	34.	37.	
10	15.4	19.2	23.	27.	31.	35.	38.	42.	46.	
12	18.5	23.	28.	32.	37.	42.	46.	51.	55.	
14	22.	27.	32.	38.	43.	48.	54.	59.	65.	
16	25.	31.	37.	43.	49.	55.	62.	68.	74.	
18	28.	34.	42.	48.	55.	62.	69.	76.	83.	
20	31.	38.	46.	54.	62.	69.	77.	85.	92.	
24	37.	46.	55.	65.	74.	83.	92.	101.	110.	
30	46.	58.	69.	81.	92.	103.	115.	127.	138.	
36	55.	69.	83.	97.	114.	125.	138.	152.	166.	
48	73.	92.	111.	129.	148.	166.	185.	203.	222.	
60	92.	115.	138.	161.	185.	208.	231.	254.	277.	
72	113.	138.	166.	194.	227.	249.	277.	305.	332.	

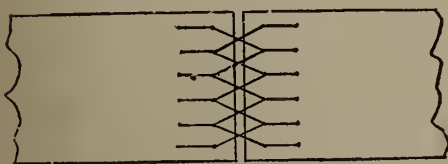
BELT LACINGS.

BY A PRACTICAL MILLER.

EXPERIENCE teaches us the best methods and the most desirable course to pursue in the various details of the mill. After twelve years experience in the milling trade and a trial of all the different styles of lacing belts that I have seen, I have settled on the two following methods as the best suited for all purposes :



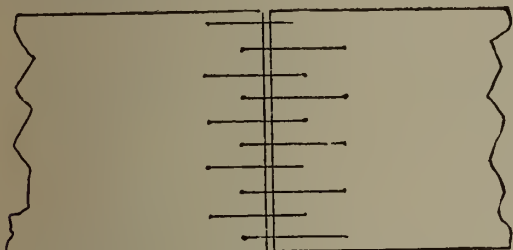
No. 1.



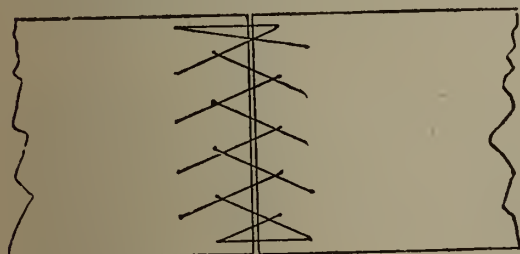
No. 2.

Cut No. 1 represents the right side of a belt, or the side running next the pulley, while cut No. 2 represents the reverse side of the same belt. On the right side the lacings are double between the two inside rows of holes, while a single lace runs from the inside to the outside holes. I use this style of lacing on roller belts and have found it the only style that will wear where the work is heavy. Owing to the vicious manner of belting many of the roller mills the strain on belts is very severe, and there is no style of lacing that will wear for any great length of time. I have found, however, that this style of lace will outwear any other that I have ever tried, and runs over the pulley with very little noise. In putting in this lace, begin in the middle of the belt and lace to the edge and back with each end. This will bring you back to the starting point, where the ends can be securely fastened.

The second style of lacing is one that I use on all large belts for heavy transmission.



No. 3.



No. 4.

Cut No. 3 represents the side running next the pulley, and No. 4 the outside of the belt. This is a single lace, there being no place where the lacings double. I can not recommend this for roller belts, but for a large drive belt it is the best thing I ever saw. The strain is distributed over so much surface of the belt that the holes will never tear out and the lap will "crack" but very little as it goes over the pulley. One important item in lacing a belt is to cut the holes clean and true, and not have them jagged and torn. Be sure, too, that you have a punch the right size, so that when the lacings are drawn through they will lie flat and even, instead of being drawn up in a tight roll.

In this connection it is proper to add a few items in regard to qualities of belting. Leather belts are considered by many as the best means of transmitting power, but few ever know or stop to think that there are different grades of leather belting. In the manufacture of leather belts the select parts of the hide are used for belts of the first quality, while the refuse parts are worked

into belts of inferior quality. Usually in first-class belts the pieces are of good length, and the laps are from six to eight inches with three or four rows of rivets, while the second-class belts have shorter pieces with laps 18 to 24 inches and six or eight rows of rivets. Millers should see to it that they get nothing but first-class belts, as cheap belts will soon give out under the severe use to which roller belts are subjected.

SPONTANEOUS COMBUSTION.

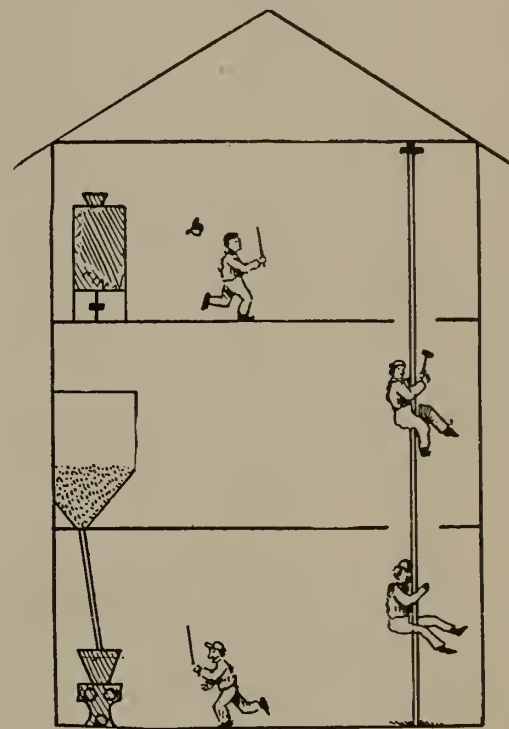
THE following is a condensed report of an address delivered by Professor Vivian Lewes to workingmen, at the meeting of the British Association recently held in Nottingham, England :

The learned professor began by showing how the labors of Priestly and Lavoisier had led to a true knowledge of the actions taking place during combustion, and showed by experiment that in all the ordinary cases of combustion a chemical union was taking place between the constituents of the burning body and the oxygen of the air. The idea of combustion, however, must not be limited to processes of oxidation, although they were the most important ; and in order to a true conception of the action, combustion must be defined as "the evolution of heat during chemical combustion." It was then shown that the rate at which chemical action took place was, to a great extent, influenced by various factors, and that there were many cases in which the action was so slow that the heat escaped as fast as it was generated, and no perceptible rise of temperature took place, and such actions were generally looked upon as cases of "slow combustion." Slow combustion was one of the most important natural actions, and by its means the waste matter in the world was slowly got rid of, and converted once more into simple gaseous compounds, all cases of decay being slow oxidation or combustion. All inflammable substances had a fixed temperature at which they burned actively with flame or incandescence, and this was called the "point of ignition." In some cases an inflammable substance undergoing slow combustion was surrounded with a non-conducting material, and the heat due to the actions going on gradually rose until the point of ignition was reached, and it was this change from the little noticeable slow combustion to ordinary combustion, with its manifestation of flame or incandescence, to which the term "spontaneous combustion" had been given. The lecturer then proceeded to consider special cases of spontaneous combustion, and showed that freshly burned charcoal, especially when powdered, absorbed oxygen from the air with considerable rapidity and with a rise of temperature, which with a large mass was in some cases sufficient to set it on fire. The important bearing of this was that beams, skirting boards, etc., in contact with flues and heating pipes, were liable to become charred at a comparatively low temperature, and this form of charcoal was very liable to spontaneous ignition when air came in contact with it. In the same way coal had the power of absorbing oxygen from the air, and when in masses of a thousand ton or more, especially when much broken and moist, would undergo heating, and even ignition. This was due to the absorbed oxygen setting up chemical action with the hydrocarbons of the coal, and not, as was generally supposed, from the oxidation of the coal. Nearly all vegetable and animal oils had the power of absorbing and combining with oxygen, and this gave them the power of drying : and one of the most usual causes of spontaneous ignition in workshops and factories was to be found in oily waste or rags, as the oil being spread on the surface of the material, offered a large surface for oxidation, while the rags or waste, being excellent non-conductors of heat, allowed the temperature to rise until ignition took place. Well authenticated cases were known in which sparrows building their nests of oily waste in the eaves of houses had caused serious fires. Hayricks which had been built from grass improperly dried before stacking were also very liable to spontaneous ignition ; this being due to the sap of the grass taking up oxygen during a process of fermentation, which evolved heat, and the heat kept in by the surrounding hay, rose until the ignition point was reached. If grass once well dried then became wet by a shower, it became mouldy in the stack, but did not heat. The lecturer then concluded by

emphasizing the fact that the so-called spontaneous combustion was merely an increase in the rate of chemical combustion from the slow stage, which was hardly noticeable, to active combustion, and showed the fallacy of supposing that the living body could undergo any such action.

POLES FOR QUICK DESCENT.

THE device illustrated and described in this article is to be credited to a correspondent of the American Miller, who, whilst admitting it is not entirely new, believes it is new as applied to the science of milling. The mills of the present day, this correspondent remarks, represent the advancement of centuries and are supplied with every appliance to perfect the manufacture of their products, and the operative millers have kept pace with the march of improvement and are equal to the occasion. However swift the modern miller may be in thought or action, there are times when his dexterity is hardly sufficient for the trials that often envelop him.



POLES FOR QUICK DESCENT.

The present article treats of a device that will enable him to quickly descend from the upper floors of the mill building, saving time and possibly an injured anatomy, which is often the consequence in going down a flight of stairs in a hurry. It will be found very useful in many ways ; for instance, bill collectors, book agents and mature maidens with subscription lists will not be kept so long in waiting as by the old way. Or, if they should get on the miller's trail and he wished to shun their presence, he could apply the device and disappear like the ghost of Hamlet's father ; and in the case of a choke up or other difficulty where it is necessary to turn in a general alarm, it will greatly expedite affairs, and in case of fire the men on the upper floors can quickly make their escape.

The device shown in the illustration given herewith, is the apparatus used in fire stations to assist the firemen to reach the lower floor quickly from their sleeping apartments, and consists of a long pole about ten inches thick, extending, in the case of the mill, from the grinding floor through openings in the other floors to the attic. It should be well rounded and rather smooth. It will soon acquire an extra smoothness, however, by use, and it should be made of wood not liable to splinter. Around the base of the pole should be a padded cushion to break the force of a rapid descent.

Professor Pickering reports the discovery of forty small lakes in Mars.

Some recent investigators claim that the sweetness and fragrance of the very best butter is due to a certain beneficent species of bacteria.

A non-conducting covering for boilers, steam pipes, etc., recently patented by a Canadian inventor, consists of mica, soap-stone, molasses and bicarbonate of soda, combined in specified proportions.



THE wheat prediction of Mr. Van Horne has recalled a story of the late Jacob Hespeler, of Hespeler, Ont. It is as follows: At one time Mr. Hespeler was consigning large shipments of flour from his mills at Hespeler to Gillespie, Powis & Co., of Montreal, at that time one of the largest commission houses in Canada. After he had filled every available foot of their store rooms and announced the shipment of a lot in addition, he sent instructions to sell out on a certain date, some months in advance. The firm refused to store and sold out much to Mr. Hespeler's annoyance, but being a commission firm he was powerless to prevent the sale. A clerk of the firm in Montreal, who was struck by the peculiar circumstances of the cases, made a note of the date Mr. Hespeler had set for the sale of his flour, and when it arrived found flour was just fifty cents per barrel higher than any day during the preceding year or that following. The clerk was certainly astonished, and some time after when he became a wholesale merchant, being none other than the Hon. Adam Brown, of Hamilton, meeting Mr. Hespeler asked him if he would explain the circumstances which he cheerfully did, stating it was a chart that was in the Hespeler family for generations, giving the rise and fall in wheat and flour for the preceding 200 years, and the probable rise and fall in values of the following 200 years. This chart was his guide, and Mr. Brown can testify as to his correct forecast on that occasion. It is hoped Mr. Van Horne may prove as correct.

* * * *

I AM free to admit having an anxious interest in the young miller. What is to be the future of milling is going to depend on the stuff that is in the young millers of to-day. It is just as true of milling, as it is of morals, that as the twig is bent so is the tree inclined. If the junior millers of Canada are to be slipshod and careless in their methods, in another decade or two the good name of Canadian flours will have depreciated. A recent writer has complained that the average young man in business to-day is nothing more or less than a plodder—a mere automatic machine. He comes to his work in the morning; is faithful in the duties he performs; goes to lunch at twelve, comes back at one, takes up whatever he is told to do until the bell rings at evening and then goes home. One day is the same to him as another. He has a certain routine of duties to do, and he does them day in and day out, month in and month out. His duties are regulated by the clock. As that points, so he points. Verily, it is true of him that he is the same yesterday, to-day and forever. In a way he serves, perhaps, just as useful purpose as the separator or aspirator in the mill. When the steam is up and the belt is applied, he runs all right, but he stops with the stopping of the motive power. Young millers, if they are to be worthy of their fathers, must put brains into their work. It is brains that tell to-day. Let the young miller give thought to the work of milling. Strive to see where he can improve grades, where the machinery of the mill is weak, and try to suggest an improvement in the machinery. No miller, young or old, can be too capable a miller.

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"It would be very pleasant to think so, but I cannot see any good reason for making any hurrah over the \$2.00 wheat prediction of Mr. Van Horne," said Mr. J. D. Flavell, of Lindsay, as I met him on the streets of his own town a fortnight ago. "We are experiencing too large competition from other wheat growing countries, and from new wheat growing countries to look forward to any near approach to \$2.00 a bushel for wheat. It may be said, that the Argentine republic with only 50 or 70 million bushels to export, will not play a very large figure in the export trade of the world, but with increased export supplies coming from India and Russia, these figures

are not to be belittled. This, however, is only the present. Look at the great territories that the Argentina has yet to develop for wheat growing purposes, for, we are told that there is, so far, but a very small per centage of that country under cultivation." Mr. Flavell, in answer to my inquiry as to the present condition of the milling trade gave the universal reply that everything was very quiet just now. "A good level-headed fellow," is the way I heard a prominent business man of Lindsay, to whom I had mentioned Mr. Flavell's name, speak of this well-known miller whose level-headedness and good abilities are shown in the careful and yet progressive management of his mill. And of this opinion millers generally know something, for Mr. Flavell brings to the councils of the Dominion Millers' Executive, of which he is a member, just these same desirable qualifications.

* * * *

FROM several varying standpoints I was interested in the Oriental entertainments, in costume, given by Lydian Von Finklestein, in our city a few days ago. As a miller, I was interested in her description, and practical operation, of a hand-mill of Bible times, as given on the platform on the evening of her first lecture. We do not need to go as far back in ancient history—we, may indeed, confine ourselves to modern times—to form an idea of the wonderful development in milling operations, since the days of the upper and nether mill-stone. But it was quite a sight to see the use of the little hand-mill in the hands of two women. Milling in those days was a very crude affair, and if no greater speed in the turning out of the product existed to-day, we would have no occasion to worry ourselves about an over stocked market at home or across the sea. The lecturer was, evidently, one who believed in woman's rights, but I thought that the illustration of milling pointed in an inverse direction. The millers in those days were women, two of them usually operating this simple little hand-mill, and with the explanation and illustration of Miss Von Finklestein on this point, we were able to better understand the words of the good book which says, "the one shall be taken and the other left." In connection with the milling operation we had an illustration of bread-baking in those times, and were told that the bread was made twice a day. Those were indeed primitive times when roller mills and plansifters were an unknown quantity, and the millers were not harassed day by day with the condition of the wheat and flour market.

* * * *

It is quite exciting in its way these times to knock up against the grain and commission men of the country. They hardly know sometimes from day to day where they stand. Whether to hold on or to let go; is it better that they should tackle wheat or pork, are some of the few troubles that meet them. I learned the other day that the "street" in Montreal was all excited over the quotations then going for wheat; they had been holding May wheat. Pork became strong and has been ruling at about \$2.00 per barrel. Where were they? An old speculator put the case in these words: "Montreal got nipped because they held on too long; they want big profits instead of taking small ones, and suffering at times small losses." It is indeed the case that large sums of money have been lost by Montreal speculators these past years. The figure has already been given in these columns as running as high as \$10,000,000 during 1893, though that may be wide of the mark.

* * * *

It is not to be supposed that the various theories held, explanatory of the low prices of wheat, can all materialize in fact. On one hand we have the argument given us, with much to support it, that there can be little hope of wheat ever again reaching \$1.00. The antithesis of this view is reflected in the opinion of president Van Horne that \$2.00 may be looked for. I find it very interesting to get the opinion and theories of different people on this question, if for nothing else than to show how widely different the opinions of men of the same class may be. An operator of some prominence in the New York market draws attention to the fact, in support of his view that wheat will reach \$1.00 again, that the consumption of wheat has increased much more rapidly in this country during the past twelve years, than in any previous twelve years. Starting with this fact he raised the query: Why

is the price of wheat lower than it has ever been? His answer is: Simply because the crop aggregate of 1891 and 1892, so far at least as the United States are concerned, was grossly under-estimated to the extent of 200 or 300 million bushels. It is this wheat, he argues, that has kept down the price. He concludes from these premises that wheat is bound to advance on the common law of supply and demand, and that the popular theory of dollar wheat has gone for ever, and with it the many theories built upon India and Argentine competition in the Liverpool market. Well, we shall see, perhaps that is the safest ground I can take at present.

* * * *

"YES, I'm just waiting for wheat to touch \$2.00," said Mr. C. B. Watts, secretary Dominion Millers' Association, as I chatted with him the other day about grain and milling matters. "I fail to see any condition to warrant such a prediction, nor have I any strong hopes of seeing wheat very near \$1.00; at least not for some time to come. Of course some unforeseen calamity might transpire,—a famine, perhaps a big war—and the good times we are all hoping for would come along, but nothing looks that way now. Times and conditions have changed and there are good reasons why we might be satisfied with lower prices for wheat than prevailed in past years. Cost of living is much less than it was five years ago, and there is a noticeable change in a decade. I can remember in my time when in the summer we paid \$2.00 a day for farm help. \$15.00 a month and board will be accepted by scores of men to-day, and half that amount in winter. Machinery has revolutionized work on the farm, reduced the needed help, and lessened the cost of production. In a word a dollar goes farther to-day than it did a few years ago. An important factor in keeping wheat prices down, no doubt, is the expansion of wheat fields in other parts of the world. Look at the Argentina, India, Russia and even Egypt, if the proposed irrigation schemes, can be successfully developed. It is not alone the increase in the size of the wheat growing territories that has to be figured on these days, but the cost of labor in these newer countries is so much cheaper than here, that it becomes a hard matter for us to compete with some of them. Changes in methods of transportation are among the more important causes that will help foreign competition with the wheat growers of this country. India has now no difficulty in getting her wheat to the sea-board. Argentina is yet behind in this respect, but improvement is coming there. Briefly we enjoyed these privileges years ago, when India and other places knew them not. They are now coming up along side of us, and in part can do better than we can. Let these factors be considered by anyone who goes into the line of prophecy."

* * * *

"No danger of reciprocity in flour with the United States," said Mr. McLaughlin, in answer to a query on this point. "It would be the height of folly to make a movement in that direction. My friend, Mr. Campbell, the member for Kent, would be one of the first to find this out, despite his vigorous efforts for free flour before the Ways and Means committee a few days ago. He may say that we can send our flour to the New England states. St. Louis flour would knock us out every time, unless we would be prepared to drop below a paying price, and we are near enough there just now. Farmers in the interior of Missouri are getting only about 40 cents for their wheat, and splendid wheat it is. Can we make up flour to compete with wheat bought at such figures? Then freight rates would be against us. No, unless millers want to see their business ruined, they do not want reciprocity in flour. Conditions are not now as they were in the days of a former reciprocity treaty. It is true that export business with Great Britain continues slow and unsatisfactory. We in Canada are being handicapped by the discrimination railroads are making in rates of flour and wheat. Let this difficulty be overcome and we could export with some profit. The Dominion Millers' Association are moving actively in the matter and I have strong hopes the evil will be overcome. The law is on our side, as it is distinctly stated that wheat and wheat as flour come under the same classification."

ANTI-FRICTION MATERIALS.

BY KILLINGWORTH HEDGES, M. INST. C. E.

THE use of oil as a lubricant in machines is to separate the rubbing parts and diminish the friction of metal upon metal by an intervening film of the lubricant. If the oil is supplied in sufficient quantity to cause the entire separation of the metals, the friction may be reduced to a measure of the viscosity of the unguent used; where oil is furnished in less quantity, the friction of metal upon metal is usually resistance due to interlocking particles of the revolving and stationary parts, the oil used under this condition finding its way from the bearing, loaded with the metal that is gradually torn from either the revolving shaft or the bearing in which it has worked.

In discussing the subject somewhat over a year ago before the British Association for the Advancement of Science, the author remarked it to be a well-known fact that heavy lubricants effect a better separation of the metals than those that are more limpid, although the power required to slide the surfaces one upon the other is much less with the latter than with the former, but at the same time the wear and tear of the metal may be greater. It has been stated by more than one authority, that it makes little difference what metal is used for the bearing of a revolving shaft, provided oil in sufficient quantity can be introduced, so as to separate the shaft from the bearing in which it revolves. This is proved by the success which attends the use of cast iron for the bearings of ordinary shafting, it being no unusual occurrence to find the cast-iron sleeve of an adjustable hanger showing the tool marks after running several years with an excess of lubrication. Such a bearing would, however, quickly seize if the oiling were neglected, and therefore the friction may be said to vary according to the attention paid to the oiling. For very low pressures, amounting to only a few pounds on the square inch on the rubbing surfaces, oil causes a loss of power, so as to make it advisable, wherever possible, to dispense with it altogether. Professor Coleman Sellers even goes further than this and states that even when the pressure on the rubbing surfaces is less than 50 pound per square inch, the viscosity of the unguent acts as a sensible retardant.

Engineers have for a long time been looking for a material capable of being used for bearing surfaces and having a low co-efficient of friction when worked dry and without any oil. The idea is not one of recent date only, but may be said to go back to the time of the Romans, as some of the hand flour-mills found at Pompeii have the lower stone fitted with an iron bearing which evidently worked dry in the stone socket of the upper stone. The celebrated Coulomb experimented with an iron axle moving in a bush of elm, the friction being stated to be " $\frac{1}{20}$ th of the force of pressure." He also made numerous experiments with wood axles slightly smeared with tallow, and also recommended the use of blacklead. The material which he found to give the best results was green oak on elm, and I believe the wooden axles of wagons which are used in some parts of England at the present time to transport heavy grindstones from the quarries, are constructed with axles of oak in a similar manner. Throughout Egypt, in the Nubian water-wheels, which are everywhere employed for irrigation, unlubricated wooden bearings are used, which appear to wear very slowly, the surface of the bearing acquiring a fine glaze. Stone bearings have also been employed for shafts. According to Rankine, the natural stones fit for this purpose are those which are wholly free from grittiness and are somewhat inferior in hardness to iron, such as gypsum, pure clay slate, compact limestone, marble and silicate of magnesia. From the latter the substance called "adams" was made by calcining the magnesia, grinding and molding it by hydraulic pressure into blocks, which were then baked.

In addition to these oilless bearings there are others in which, perhaps, a small quantity of grease might have been employed, such as the leather bushes used in spinning wheels, and the leather band on that part of the oar which works in the oarlock may be quoted as an instance of leather working on wood. Glass has also been tried, but the only kind which has survived to the present, and has been the most successful of all, is the plumbago bearing. The author has been told by the old millwrights that this material was often used in the footstep bearing of

the upright shafts in water mills, and most of us have seen plumbago employed instead of tallow for lubricating wooden bearings, and there is the familiar example of the carpenter's screw. The first adaptation of plumbago in a more practical form was the invention of Gordon, who inserted a number of molded plumbago plugs in the standard-size axle-box of an ordinary carriage wheel. It is said that the vehicles ran successfully without any lubricating.

Graphite or plumbago is the principal ingredient in numerous inventions for dry bearings, many of which have not got further than the Patent Office. It has been mixed with pulverized iron, asbestos, vegetable fibre, paper pulp, blood and in one curious instance sponge is used. In nearly all these applications the anti-friction composition is packed into suitable grooves, which are used in the bearing in very much the same way as asbestos is used in cocks. A substance which has been termed "metalline," which, although it contains graphite, appears to be composed of finely divided lead, has been rather extensively employed. The chief disadvantages were the expense due to the way the material was used, in the form of little plugs let into drilled holes, and the necessity for oiling when the plugs were worn sufficiently to cause contact between the metallic surfaces, thereby changing the character of the bearing.

The latest form of dry bearing is of solid material, which can either be molded so as to fit any plumb-block, or can be tooled or worked in the same manner as an ordinary brass. A new material for this kind of bearing, recently tried in the United States, is termed fibre-graphite, and consists of finely ground plumbago, mixed with wood fibre in a moist condition, and pressed into a mold of proper form. It is then saturated with some drying oil and oxidized in hot dry air. This bearing has been favorably reported on by a committee of the Franklin Institute, and a shop has been fitted up complete, so that the whole of the machinery, including the steam engine, runs without any lubrication at all. The report, which may be taken to apply to dry bearings generally, states "that an invention of this kind by diminishing the use of lubricants, diminishes the cost of machine construction by doing away with the many devices incident to oil—oil cups, oil-hole covers, the oil-hole themselves which have to be carefully placed, oil tubes to lead the lubricants to the inaccessible parts of machinery, as well as the cost of the personal attention and the cost of the lubricant required to keep the machinery in perfect order."

My own investigations on a suitable material for an oilless bearing began with the use of plumbago, which was molded so as to form a circular bush, but this was soon discovered to be a failure on account of its rapid wear. I then constructed bearings of ordinary carbon, such as is used in batteries, and for producing the electric light by means of the voltaic arc. The first experiment was made with the bearings of a small dynamo, which ran for a considerable time, but the drawback of using carbon was mainly on account of the impurities which it often contained. A small amount of silica in the carbon was found to cut the shaft very badly, while if soft carbon was used the wear was as rapid as with plumbago. In order to lessen the cutting action and the friction, finely powdered steatite was mixed with the carbon, and thenceforth no difficulty was experienced, even when the load was unequally distributed on the bearing. The name of carboid has been given to this mixture, its specific gravity being 1.66, that of carbon as used in arc lamps being about 1.68; therefore carboid is about one-fifth the weight of brass. It can be molded with the same ease as carbon, and can be turned, bored or shaped to any desired form. In practice it is found that the cylinders, as they leave the molds, are quite true enough to be put into bearings without any tooling, although it is preferable to run for a short time with half the load and then remove and scrape the bearing, so as to equalize the surface of contact.

Professor Sellers, writing on the Franklin Institute report, states that "the co-efficient of friction is lower with the dry bearings experimented on than that of many oiled bearings in good condition, and that it is undoubtedly lower than with metal bearings, as usually operated with moderate attention and poor qualities of oil. It seems to be constant in its frictional resistance, whether warm or cold, while it does not run lighter when worn by use,

as some oiled bearings do. Its uniform action is better than many oiled bearings and very much safer; the constant amount of frictional resistance being known can be provided for in the power of the machine." The above agrees in the main with Professor Unwin's experimental results with carboid. A bearing $1\frac{1}{2}$ inches in diameter by $2\frac{1}{2}$ inches long, cut in halves, was tested under loads varying from 100 pounds to 1800 pounds, or about 15 pounds to 170 pounds on the square inch, at speeds from 110 to 490 revolutions per minute, the period of test extending over six days, during which the bearing was kept almost constantly running without any lubrication or attention.

Summarizing the experiments, it appears: 1st. That the co-efficient of friction is almost the same and has not diminished as the carbon became worn to a better bearing surface. 2nd. That the co-efficient of friction increased as the temperature increased during the run, but is practically the same for any increase of pressure, and diminished with increase of speed, the maximum number of revolutions per minute being 490. 3rd. That no injury is caused to the shaft even if the bearing gets very hot, as it was found to be impossible to make it seize.

The conclusion arrived at by the author with regard to dry bearings is that the frictional resistance is governed by the conductivity of the shaft and the holder or support of the bearing; if this be so arranged that any heat generated be dispersed, the co-efficient of friction will not exceed that of a lubricated bearing.

If the bearing works under such conditions that any heat, generated at starting a new bearing, may readily be conducted away, the first cost of a dry bearing will be less than any form of brass, but taking a case of a dynamo bearing where any excess heat might be disadvantageous, it will be necessary to carefully true the bearing by scraping so as to fit the shaft, and under certain conditions where there is a great pull on the belt, it may be necessary to keep the bearing cool by means of a circulating flow of water. The economy of working is very marked. Besides the cost of the lubricants used in large establishments, there is also the attention required to apply the oil and keep the parts clean. In laundries and in those trades where unskilled labor is employed, the danger of oiling machinery in motion is very great; besides this there are instances where the lubricant used is in itself a source of danger, such as the risk of oil waste taking fire by spontaneous combustion, and the dip from bearings certainly renders the floors of the mills highly inflammable.

The principal application of carboid up to the present time has been for the bearings of ordinary shafting, and for bushing loose pulleys. It has also been applied for the bearings of steam heated rolls such as are used in cloth mills and paper works. The result of two years' experience and many experiments with light trucks seem to point out the desirability of extending its use to the axle-boxes of tramcars, and perhaps railways generally, as it involves no change in the axle-boxes; even the existing brass can remain and be faced with carboid, which can be cemented to either a smooth or rough surface.—Cassier's Magazine.

MIX THE MOVEMENTS.

DOUBTLESS many of our readers, who are not experienced engineers, may have noticed that frequently the oscillations of the main belt in a mill come in unison with the beat of the engine, and a perceptible slapping about of the belt is noticeable. The beat of an engine will often come in sympathy with the sway of the building, and so increase it as to be very perceptible. If this were continually going on in exact time it would become so great in time as to be dangerous, but one or the other gets ahead and mixes the movements so that it gradually ceases until they are again in unison. If the speed of the engine is changed in either case the swaying will be kept mixed all the time instead of occasionally. On long lines of shafting this will appear also, the pull on the belt at the commencement of the stroke being in unison with the spring of the shaft, thus causing a marked oscillation. The remedy is applied here—to mix the movements purposely—and the trouble is partly if not entirely removed.—Machinery.

MILLING SYSTEMS.

ONE of the most familiar names among the writers on milling topics in the present day is that of R. James Abernathy. In a late issue of the Tradesman he discusses at some length various milling systems, ancient and modern, touching the matter of power for mills, which is always timely. As to engines, the same rule should be observed, and secure such as are the most economical users of steam. For mills of 100 barrels capacity and upward what is known as the Corliss type of engine is perhaps as well adapted to flour mill purposes as any class of engine now made, although there are others that are equally well adapted in every way. It is not intended to make any improper comparisons nor to make biased distinctions, and the name Corliss is here mentioned because it was among the first, if not the first, engine of that class ever produced, and still possesses all the essential features of the most perfect types of automatic engines.

This class of engines, all who are familiar with steam engines are aware, consume just the required quantity of steam for doing the actual work by automatically cutting it off the instant sufficient has entered the cylinder for doing the work of the stroke, as against the old method of each stroke absorbing a given quantity of steam whether required for actual work or not.

By the old plan the valves were set to close the inlet port at a point when it was sure that steam enough would be admitted to safely carry the engine through the maximum struggle it would be likely to be subjected to, otherwise the engine when laboring under heavy burdens might stop and cease to do its work. If, therefore, an engine on the old plan takes steam at a half or five-eighths stroke in order to do the heaviest work, it also takes the same when doing the lightest work, except as the volume may be regulated by a governor-throttle, which is at best an imperfect regulator.

By the automatic plan, however, the governor which holds the port-valve open lets go of it the instant the lessening of the work demands it, and the port is closed at that instant. On the contrary, if an increase of work demands more steam the governor clings to the in-port valve long enough to admit the quantity of steam required and then lets go. It is the adapting itself to the varying requirements of the work being done that makes the automatic engine an economical consumer of steam, and the best for not only flour mills but other manufacturing plants. The very small mills are, as a rule, obliged to use different types of engines. But among the classes of small engines there are quite a number of what are called automatic engines which, while if not quite so economical in the use of steam as their larger brethren above referred to, are at least quite an improvement

over the old class, and from those every small mill owner seeking for a new engine ought to be able to make a good selection by following substantially the suggestions here given and remembering that economy, other things being equal, should be the main guide.

In the line of general suggestions Mr. Abernathy has this to say: When buying belts to transmit power, it always pays to buy good ones; belts that have life and energy to them. This should be true of all belts in use in flour mills, or for any other kind of work, but more especially should good belts be purchased for driving the rolls. The peculiar method of belting most roller machines makes it severe and trying on the belts, but the best oiled tanned should be used for the purpose, and they should be either heavy single, or light double.

Tightening pulleys are very vicious devices, and add much to the trials and vicissitudes of a belt when hard at work. They do much to wear out and shorten the life of belts, and should never be used except when necessity compels it.

If obliged to use tighteners, never fail to place them against the slack fold of the belt. Placing tightening against the tight fold of a belt is simply compounding a felony. When so placed by accident, ignorance or otherwise, they have to be kept so hard against the belt in order to make it work at all, that the life of the latter is reduced to one-half or less. Look out for this evil and do not commit the error.

The spouting velocity of water is as the square root of the pressure, or the height of the head. Thus from under a head of 4 feet the spouting velocity is 16.2 feet per second. From under a 16 feet head it is 32.4 feet per second, and from under a 64 feet head the velocity is 64.8 feet per second.

At first glance it looks a little odd that when the head is increased sixteen times in height the spouting velocity is increased only four times; but such are the peculiar laws of nature.

Flour packers are now so very cheap that every mill should be provided with one or more, as the case may be. Those that need more than one generally have them, but the small mills needing one only usually or very frequently have not that one. It is a great labor saving machine and will be found an immense relief in all small mills where help is small and light.

With the very best arranged mills and the best steam power plants the amount of coal consumed to the barrel of flour made may be reduced to 30 pounds or less, but the average is much above that. He emphasizes the necessity of good judgment being used in all such cases, whether steam or water motors be used. The former being more commonly in use, so very numerous and of all kinds and varieties, probably require the

closest attention and the strictest vigilance in making selections.

It has heretofore been the custom to give more attention to the engine than to the boilers, although the latter would seem to be of just as much importance to the user as the former, where economy in the use of fuel is considered, and that is really the prime factor.

In the boilers the steam is generated by the combustion of fuel, and if there be any difference in boilers in that respect the one generating the greatest amount of steam or evaporating the greatest quantity of water with the least quantity of fuel is, if other things are anywhere near being equal, the one to be selected.

Of course, in addition to this very important feature, the boiler must be well and scientifically made and of the very best material.

It will not pay to select a cheaply made boiler, one that will burn out or blow up in a few years, because it is an economical generator. In construction it should be good in every way, and if all these good qualities are combined that is the generator to select.

SOLD FOR \$57,000.

THE sale by auction of the Peterborough Milling Company's property took place, at Peterborough, Ont., on the 11th inst., and from the valuable interest which is represented in the property excited considerable attention. A couple of hundred persons attended the sale, which was conducted by Mr. John Haggart, auctioneer. Only \$1,000 bids were taken up to \$50,000 and then \$500 offers were accepted. In the course of the sale it was announced that the reserve bid was \$55,000.

The bidding started with an offer of \$25,000 and this was jumped with \$5,000 leaps to \$40,000. Messrs. T. G. Haslitt, John Carnegie and Thos. Bradburn were the only bidders, and Mr. Haslitt dropped out after \$42,000 was reached. When the figure had been carried up to about \$47,000, the bidding came to a standstill and an intermission of five minutes was taken. When the sale resumed Mr. Bradburn and Mr. Carnegie renewed the bidding, and the hammer finally fell at \$57,000, which was Mr. Carnegie's offer.

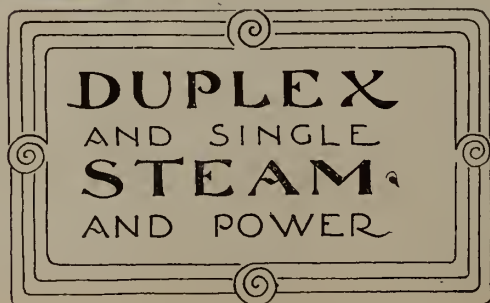
It is understood that Mr. Carnegie has purchased the property entirely independent of the Company, and it is probable that the mill will be leased to a tenant without much delay, and put in operation before long. The property cost the Company, it is estimated, between \$70,000 and \$80,000, and the mill is equipped with the most improved machinery.

It is an interesting fact to recall that on April 11th, 1864, just thirty years back, Mr. Carnegie began the work of building the stone mill that has stood for so many years on the property and that has just been improved and enlarged. On April 7th, 1864, the first mill, a wooden structure, was burned.

Chlorine gas, decomposed from sea water by means of electrical machines, is employed for disinfecting the hold, store-room, etc., of vessels of the Italian navy.

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CHEAPEST NOT ALWAYS THE CHEAPEST

It has come to be admitted by even superficial buyers of the most trifling articles of consumption or wear, that the cheapest, so far as the price charged may be considered, is not always the cheapest. Ask the sensible house-wife on this point and one will get her answer.

We are hearing a great deal lately of the cheap wheats of India, Argentina and other foreign countries, but the question is being asked by some, is the value really in these wheats after all? A great deal depends on the cleanliness of the wheat received at the mill; if a bushel is made up partly of dust and dirt its price must be discounted just that much. There is room for improvement in wheat cleaning and clean wheat in this country. Manitoba had her experience in this respect a year ago when considerable smutty and dirty wheat was exported to the United Kingdom, and Manitoba suffered and the entire Dominion suffered. Our friends in these territories were quick to see this error and are not likely to allow their reputation for fine wheats to be prejudiced again in this manner. It is generally admitted, however, that in the wheat that goes from this side of the Atlantic a brighter, cleaner and more useful wheat is to be counted on; and whilst the foreign importer may be influenced by price he will come to see by a little experience that price is not everything in wheat any more than in other matters.

MR. LAURIER TELLS WHY.

CLOSING the debate on the tariff a week ago, from the Liberal point of view, Hon. Wilfred Laurier devoted some attention to the present depression in wheat prices. To his fellow Commoners in the House, he said: "What is the cause of this decline in the price of wheat? In the days of old, when Rome, with her four million souls, was the political and commercial centre of the world, she drew her food supply from the lands washed by the Mediterranean Sea, from Spain, Egypt, Sicily and Algeria. In the present time England is the great commercial centre of the world, and England, like Rome, cannot produce wheat enough for her own consumption, and she has to import it from abroad. For many years she got it from the continent of America, but of late years she has gone to Southern Russia, to India and to the Valley of the La Plata in South America. She has so many sources to draw from it is not surprising that prices in England should have reached the lowest point. It is acknowledged that the price in Canada is regulated by the demand in England."

SENSIBLE MAN.

In a communication published in this issue, says the American Miller, a fireman gives a very good reason for leaving a place. In order to propel the machinery of the plant it was necessary to carry more steam than a test of the boiler showed it should carry. The shell was very old and rotten and the fireman would have been very foolish to have remained in charge any longer. If every fireman would refuse to stay in charge of plants that were unsafe many boiler explosions would be avoided and the owners would be saved much money.

A shipment of 8,000 bushels of wheat was recently sent from London, Ont., to Great Britain.



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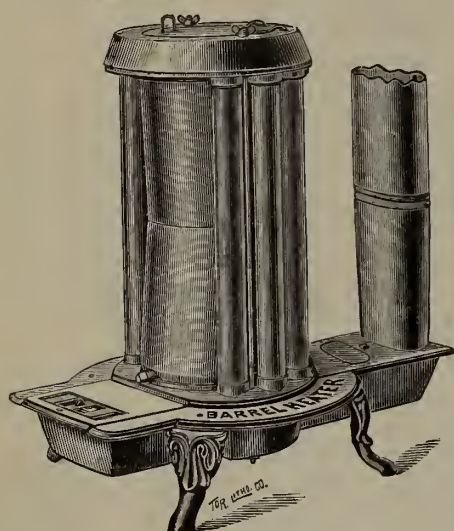
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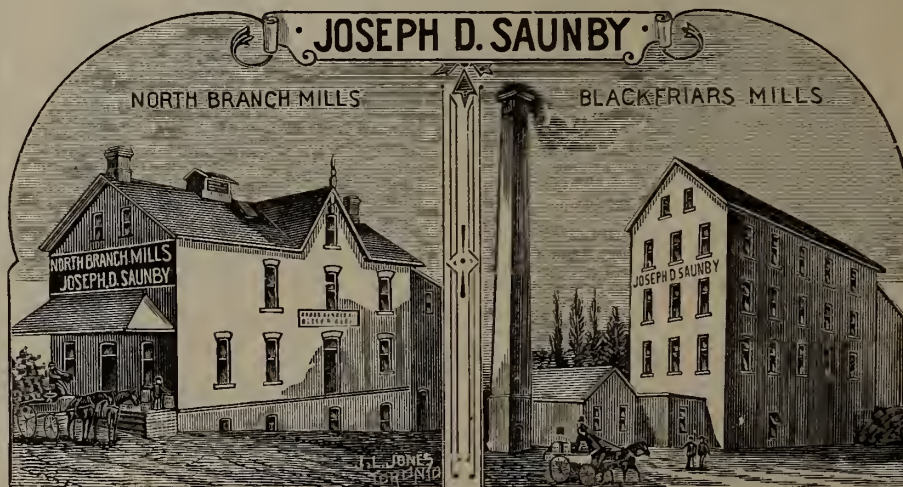
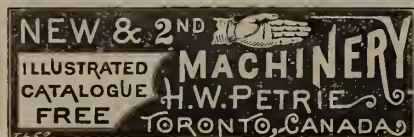
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Up to the present time the insurers with this company have made a saving, when compared with the current exacted rates, of \$91,004.20. And in addition thereto bonus dividends have been declared to continuing members amounting to \$21,522.72.

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserve (based on the Government standard of 50 per cent.—(50%), a cash surplus of 1.93 per cent. to the amount of risk in force.

Such results emphasize more strongly than any words I could add the very gratifying position this company has attained. I therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted, and the retiring Directors unanimously re-elected. The Board of Directors is now constituted as follows: James Goldie, Guelph, president; W. H. Howland, Toronto, vice-president; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

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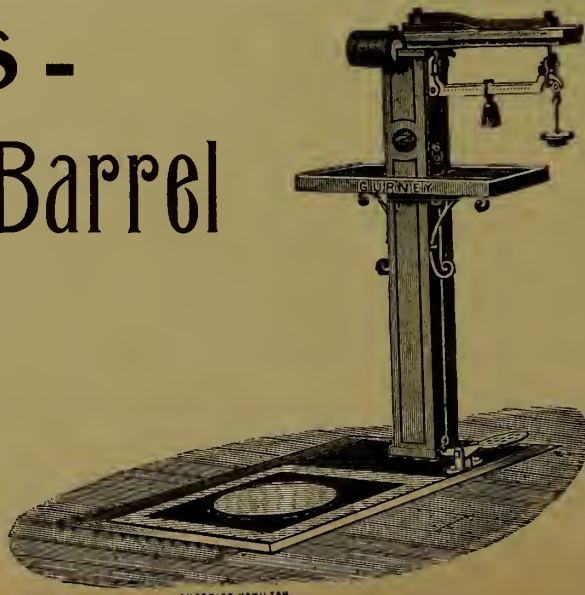
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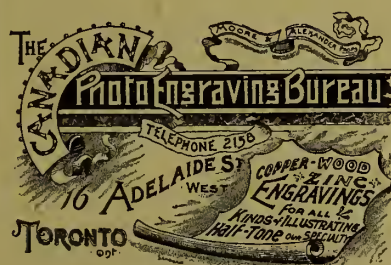
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ROPE TRANSMISSION.

ROPE drives were very seldom used in flour mills in this country prior to the introduction of the horizontal water wheel, writes A. E. Baxter in the North-western Miller, and this change in the use of water wheels has had more influence in bringing about the use of ropes for the transmission of power in milling plants than all other causes combined, and has been more effectual in removing existing prejudices than the most silvery-tongued orator that ever took the road in behalf of a cordage company.

By the use of the horizontal wheel, a road was opened to dispense with the much-abused upright shaft and its connecting gearing. Let them rest in peace. They served their day and generation well when properly erected. The change, however, brought along its attending evils, making it necessary to place the driving shafts down in the wheel pits and close to the tail water, where there is always moisture. That made belting of all kinds short-lived, and in cold, freezing weather great trouble was experienced in preventing slipping of belts, as the majority of locations did not admit of using pulleys of more than six or seven feet diameter, and the great width of belt necessary, over such small pulleys, was a persuasive argument in favor of rope transmission. The readiest remedy for this evil was in the rope, as it presented two great essential qualities—small amount of room and not being affected by the attending moisture in such locations. To-day there is rarely any other form of drive used to transmit the power from the turbine to the main line shaft, and it is also seldom that ropes have been used further in mill construction. There are, however, several mills which have used the rope throughout on their main drives, but have found no decided advantage, if any at all, over the use of belts where there was no moisture to contend with and where pulleys of suitable diameter could be used.

That there have been numerous failures of rope transmissions, is not greatly to be wondered at, when we consider that it is but a few years since the rope came into common use, and the manner in which some of these transmissions have been erected. There are two causes that have contributed more to the unsuccessful

of the drive. One drive is well remembered where six idlers and one tightener are used in transmitting power from a line to a counter line, where not a single idler was necessary. The designer no doubt thought the more crooks the better the drive.

Rope transmission has made possible the utilization of numerous heretofore worthless mill sites, as the power can be readily transmitted to available points where it was impossible to run a line of shafting without an expenditure of capital that made the power worthless. Rope transmission can be used without covering, as the action of the weather has but little effect on the durability of the rope, if properly made, and if properly erected it will

same sized pulleys would be 76 inches), economy in first cost, decreased expense in maintenance and operation and absolute absence of slipping and liability to injury through dampness. The form of groove used for this drive is illustrated in Fig. 2, and is the most successful form of groove in use for sheaves of less than 12 feet in diameter. The form of groove in Fig. 3 has many advocates, but it has failed in practice to come up to the high standard of excellence that has been attained by the former, and should never be used on sheaves of less than 12 feet in diameter. There is fully as much loss due to friction as in form No 2.

One great point in rope transmission, is to use as large sheaves as possible and a large diameter of rope. Never use a rope of less than 1½ inches diameter where it can be helped, always giving preference to larger rope and fewer strands, as the power does not increase in direct proportion to increased diameter of ropes. The larger rope, properly proportioned, will last longer and consume less power by loss of friction. One great advantage in the use of larger ropes is, they are made of more strands and nearer approach a true circle. They are also made with a hemp core, which adds to their durability, and run over sheaves with less jar than the three-strand ropes. Idlers and tightener sheaves should always be round bottomed and have more width between flanges than on the driving sheaves. The alignment, while not so much a necessity as where belting is used, should be as true as possible, to avoid chafing of ropes. Rope for out-of-door service is generally laid in plumbago and is not effected by the weather.

The grooves for out-of-door transmission should be further apart than for inside work, and, to prevent injurious chafing of ropes, due to swaying caused by the wind, idlers should be used as far apart as possible and as light as it is possible for them to be made. The illustration shows what is probably the most noted rope transmission at present in operation in America, and it was put in for the Boston Montana Consolidated Copper & Silver Mining Co., of Great Falls, Mont., and transmits 1,500 hp, which is supplied by Black Eagle Falls on the Missouri river, and furnishes power to the smelters and concentrators.

The loss of power due to the transmission by rope is

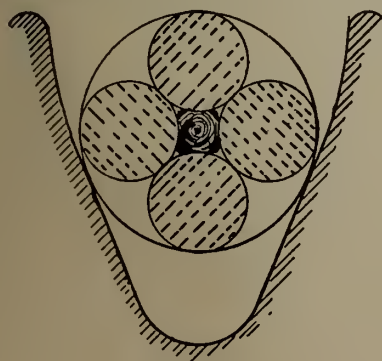


FIG. 2.

workings of these transmissions than all others combined. They are improperly turned and badly shaped sheaves and improper erection. Another and third cause that is almost as fatal, and is exerting a great influence, is that the majority of persons planning their transmissions are evidently interested more in the sale of "idlers and tighteners" than in the economic working

cause no inconvenience from shrinkage. The question of superiority of the continuous wrap or single rope with a take-up, over a number of single ropes, seems fairly settled, as one now scarcely ever sees the latter in use. The great number of splices in the latter has, however, had more to do in influencing this decision than any other cause. By the use of one rope, wrapped continuously around both sheaves, with one extra groove in one sheave and a tightener, a perfectly uniform load can be had on all driving strands. The tightener, being automatic in action, can be weighed so as to drive the load required without undue strain to the ropes, and readily adjusts itself to the varying conditions of the weather, and, there being but one splice, trouble from this cause is reduced to a minimum. Cordage men will tell you it is not necessary to have a difference in diameter where a splice occurs; but in practice you will always see it, and they are all advertising "experienced splicers can be sent on short notice," thereby acknowledging that the matter of making a splice is not so simple as it looks.

The pictures herewith shown will serve to illustrate a rope drive of this kind, transmitting 850 h. p., using 12 1¼ inch ropes, working under a load of 500 lbs per rope. The advantages of this drive are clear, viz., the amount of power transmitted over moderate sized sheaves, economy of space occupied by ropes (the face of sheaves being only 31 inches wide, while the width of belt necessary to transmit this amount of power over the

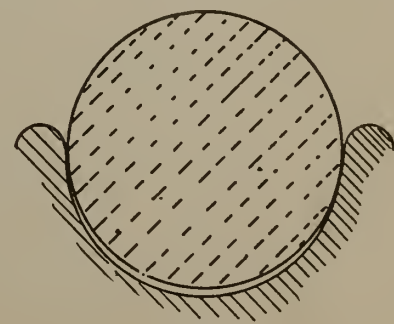
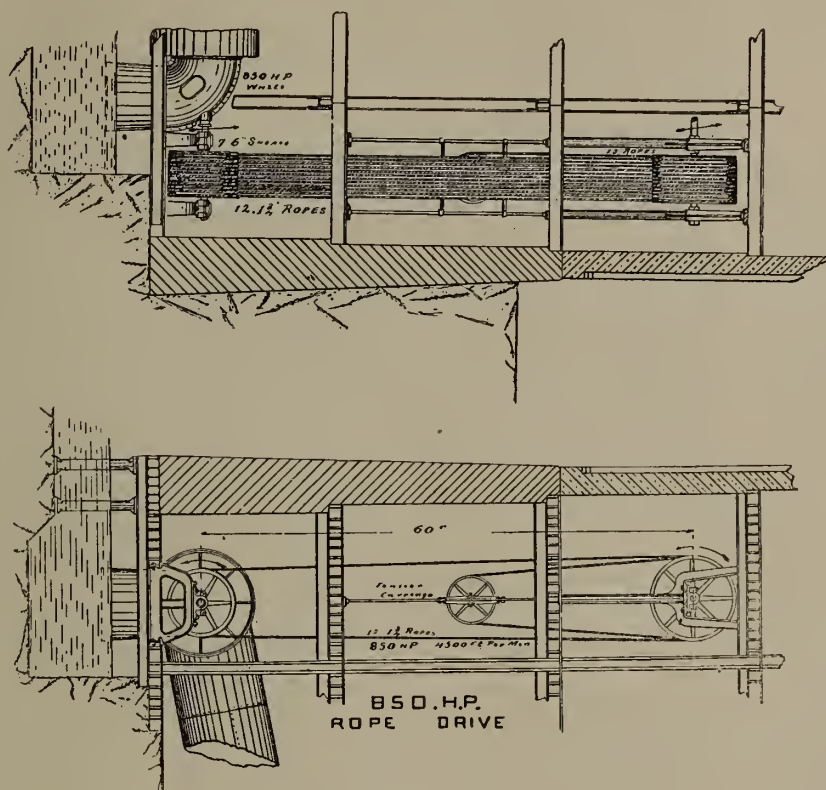


FIG. 3.

a question that, as yet, has never been successfully settled. Some claim from actual experience as great a loss as 40 per cent has occurred, owing to defective and improper construction of sheaves and unnecessary idlers and tighteners, while some engineers claim to have reduced the loss to something less than 4 per cent. This is certainly much below the average, and must have been

the result of extremely favorable circumstances, while the former was, no doubt, due to imperfect construction and sheaves with grooves of different diameters, which would rapidly consume power. Perhaps an average of 6 per cent would be a safe basis to work on for fairly-constructed plants. Some engineers claim that the centrifugal force of the rope is enough to free it from the grooves and that no power is consumed there. This, however, has not been my observation. Any person visiting two cable power plants, one driven by spur gearing and one by rope gearing, can not fail to be impressed by the quiet, smooth manner in which the rope performs its labor, while the gearing causes such a racket and jar as to cause the whole earth to tremble, or to believe that the rope consumes a great deal less power in such instances in the performance of its work.

Experience has so far failed to show that rope transmission has any advantage over belting, except about on the line herein specified; nor do I believe there is any saving of power over a good leather belt, but I willingly admit that there are places and circumstances where the rope is preferable, and I also believe rope has been put in places where belting would have given better service and been more satisfactory in operation. In speaking of rope transmission, reference is made only to manilla rope, as wire rope is no longer "in it" for driving purposes, and may be safely laid to rest with the upright shaft and bevel gearing.

SUCCESS IN MILLING.

By JOHN METHERELL.

A BEAUTIFUL picture presents itself to me daily as I peer into the face of a boy, who, upon persuasion, undertook the toilsome task of working up percentages, yields and expense accounts of the three large mills over which I have supervision, and in which labor he has to produce twelve and twenty-four hour reports, and copy the same, to eventually furnish weekly, monthly and yearly statements. To him, as would be the case with many others, the work was exceedingly irksome and harrassing at first, but by daily application and continued industry it became a pleasure in due time to see him master the fatigue of close calculations, and rise from his labors with a bright, glowing smile of pride and satisfaction in having overcome the task which at first appeared overpowering. The boy was taken from a position which offered him no opportunity of advancement, pecuniarily, and was asked to grapple with the present problems with which he has to deal, daily, for the same recompense. Certainly no cheer seemed in view for him, when so much more arduous work was to be accomplished. What, then, induced him to leave the easy for the hard duty? 'Twas this: He mentally divined, by becoming victor over his environments, he would impose his merit to those in authority, by his work, not words, and eventually earn the recompense his due. In other words, the boy meant to succeed, and the ambition of his mind was to produce happiness, first to himself in the accomplishment of his duty, and peaceful joy to dependent but loving parents to whom he is dutiful, tender and obedient, cheering their hearts at present by his virtues and scanty means, and hoping in future to care for their necessities through the reward of his exertions, which he is sure to attain at no distant period. The impelling force urging him was love for mother, primarily. Successes are products of impetus, which is not the possession of a laggard.

Even to be a successful head miller qualities must exist in his make-up of sufficient quantity and kind to render him equal to the occasion, and the quality must be genuine. He need not be a great scholar and fluently speak a half dozen languages, but of necessity he must possess a pretty sound knowledge of the English language and mathematics, together with the principles and uses of the draughting board. The day of large margins is passed, and exactness becomes an expedient; the guess business is supplanted by perfect knowledge of, first, what is required, and in the next place how to produce. Capacity, yield and percentage are the mile stones along his daily route, pointing their fingers before and behind, lucidly guiding onward to full attainment, or lamentably distancing the required goal. Education is a requisite in such a position, or some one has to do the figuring

and oftentimes chagrin takes the place of confidence, and morbidity is its companion. Guessing at results is one thing, but figures never lie when naturally applied, and old Davy Crockett used to say: "If you want a thing well done do it yourself."

Force cuts quite a figure with such an individual, though he may be very far removed from a tyrant, nevertheless he has it to get as as persistently used, to accomplish his aims, or rather, to achieve what is expected of him. Problems are not self-unraveling; government is not contained in the yielding mind the sleepy eye, and in tired, slipshod feet, neither, usually, in boisterous attitudes, but to command respectfully the bearing of nobleness is always present, and the gentlemanly demeanor is pronounced. Nero of old Rome terrorized and vanquished by tyranny, but Washington lives in the hearts of his countrymen, though long removed, his accomplishments being promptings of loyalty and love. Both had power, but what a different picture does history present. Force is the tireless companion urging ever onward the restless, energetic and observant aspirant, whether chastened by caution and good judgment, or pursuing the untrammelled road to obloquy and desolation.

Adaptation cannot be overlooked in the construction of the head miller. Naturalness produces ease of accomplishment without fatigue. It becomes a pleasure for our prima donnas to execute their charming vocabulary of music, bearing their hearers beyond themselves far into the mystic arena of song and forgetfulness of surroundings, but they would make very ordinary actors if placed on the grinding floors of some of our American mills. Howbeit, were it not for adaptability, seclusion, not fame, would bear them company. An old adage says very pointedly: "You can't make a silk purse from an old sow's ear." Neither can successful millers be made of gas and buncomb. Progression without pretense, individuality far removed from copyism, perseverance, observation, aptness for position, firmness, penetration and the like accompanying virtues, are essentials requisite for an ideal composition of a head miller, and when unaccompanied by the natural vices of bad, dissipating and desolating habits, the individual goes from success to success, naturally, as the limpid and clear streamlet finds its way to its final home, the ocean of rest, because qualified. Successes are as naturally produced as are the fruits growing upon the tree set in position by selection, with the soil adapted to its growth to produce the stimulus necessary to bring forth the business fruit. So, naturally, to render millers successful, the intuition must be present, just as the sap within the gnarled bark of the tree, to distinguish the avenues of economy through which success arrives at the miller's persuasion.

Primarily in this particular is the selection of grain. Good flour was never produced by the use of poor wheat; still, cupidity in many instances, induces the buyer, and when such is the case, the miller has a hard time in trying to work out an impossibility, and, if he is not familiar with the nature of given varieties of wheat, he himself will always be in hot water and keep it streaming, to affect all others who come under his command, and what is worse, he himself subject to insult from his superiors and still be powerless to controvert the attack. No spring wheat miller who expects a heavy percentage of middlings from which to produce his patent flour would enter the grainaries of soft wheat for purchase. If he did so and expected his head miller to produce his requirements he would be either a fool or a knave; a fool in not possessing the necessary knowledge for purchase, or a knave in trampling on the credulity of an honest miller, though void of information. The same mill operated on various kinds of grain, produces results as varied as the grain submitted to operation. No miller, however great his egotism, can counteract the effect of the natural composition of the grain submitted to his use.

Yellow wheat will produce yellow flour in spite of every attempt to remedy, and white wheat, of many varieties, will produce something far removed from white flour. Suitable for the grades required must be the attendant wheat supply, and the knowledge of purchase must essentially govern, by possession, the purchase of the buyer. The qualities of flour produced from Lost Nation wheat, raised in the Northwest, compared with

its sister varieties of hard Fife, etc., will present quite a contrast in comparison, percentage, dollars and cents. Likewise, is found a disagreement between the results effected in winter wheat mills, where an interchange exists between Mediterranean and sister varieties, compared with Fultz and its class. Even if the required wheats are not to be procured, the knowledge of attendant results must be known to render a composed mind and a courteous disposition. "Knowledge is power," and "a little learning is a dangerous thing," but in order for a miller to mill with economy he certainly has to possess full knowledge of the effects of his wheat supply, and when his requirements are met in this direction his battle is half won, and it is left for his mill and his knowledge of milling to produce just what his office expects of him.

Following the wheat supply, the question insinuates itself with reference to the requirements a given management may expect of the mill and the miller in charge. A limit of responsibility must be formulated, and the formula dare not traverse beyond the boundary of practicability. Usually the base of production is governed first, by the practicability of the wheat to produce, and second, according to the requirements of the immediate markets becoming its patrons. Percentage, yield and grade are factors in the deal with margin, which, when mutually agreed upon and all the foregoing necessities complied with by the office, the duty of the miller is rendered plain, and it is with him whether success or failure attend the subsequent effort.

The positive knowledge of the effects of separation in stocks through previous research engages the attention of the miller at this stage of the game, and according to his possession and not to his guess, proportionately, are the best results obtained. Milling, scientific, presents a broad, wide and deep expanse of territory, and the miller who will succeed must be at home in any plant, of any capacity, to which he may be introduced, equally comprehensive and liberal. Superficial observation and slouchy developments never yet produced the necessary qualifications to enter the broad field of universal milling, and the day has come when if millers would occupy through profound research, it means application, observation, development and a life given over to the love of the profession. Very little time for pleasure is allowed for such an aspirant, but in due time, if opportunity permits itself, the knowledge attained receives reward.

As accurately as a physician diagnoses cases coming under his care, so the miller, in turn, piles up his knowledge to be used in an emergency, and with equal correctness. The day of cut and try is gone, and milling is to be treated just as effectually as a fracture is in a disabled member. By the necessary study the achievement becomes easy enough, but whoever reaches the peak can view with pleasure the valley beneath. There is no excuse for bad diagraming and consequent expenses, as mentality and application can, and has, and will continue to produce the necessities for the emergency. So the miller's duty here again is to fully grapple with the case in hand and prepare his mill to produce, not only a spasmodic effort at yield and percentage, but a continuity of production in keeping with the grades of wheat with which he has to deal. The life of his mill and personal reputation, together with financial success depends upon it, and, as the day dawns to a close, so the live, educated miller seeks to inform himself as to his production, which, if all's well, produces content, harmony and grace in the miller's ranks and greetings of kindness and respect from the office, and the day's ending if all is well done, dissipates the clouds which under the guess regime may shroud in gloom, because of the lack of information on which the work is formulated.

Perfect flour, evenness of grade, continued percentages with yield, are the effects of profit diagraming, and while this makes the greater part of the whole wherein is located the economies of the mill, the cleaning room, and the adaptation of suitable machinery for necessary production is not a mere sideshow; it is necessary; it is eminently important to scrutinize. Coupled with this, while last but not least, is the item of labor and labor saving devices. All this, and more might be added, are essential qualities of a successful head miller, and

through which he observes, locates and executes the economies as depicted in his plant.

I have seen failures where yields on winter wheat were produced at four and thirteen-sixtieths bushels of wheat per barrel of flour, but it was due to indiscretion, and while true economy exists in perfect yields there is a boundary in the constituency of the wheat product where it is seriously hazardous and dangerous to commingle, and some I know have learned to their sorrow, while possibly not detecting the real cause of disaster. Economy means prudent management, with discernment, but false economy usually leads to distress and ignominy.

After all this has been said there is still a point which should receive a passing glance, and that is the proper relation of the practical miller toward his employer's interests. The true economist in the mill views with becoming pride his surroundings of success, which are the offshoots of his practicability. It will be remembered, however, that when the practical man has transacted his part successfully, as far as his administration extends, he cannot be made responsible for any defects in buying and selling of products, through which many disasters come; his record is as clear as the noonday sun, whatever may happen to an institution. The interests of the employer are identical with himself and are discernable in his everyday act, and should as frequently receive the daily encomiums due his responsibility.

The man who produces the foregoing is not a Saturday night man, but indefatigable. He consults his requirements, and produces as dictated, and the usual result is the cementing of true friendship which is a link hardly broken. For years, personally, I have never sought rest until a full knowledge of my daily transactions had been made manifest, until it has become habitual to me, and it is surprising how inaccuracies in running can be detected by this observance, even, without personal attendance, and how quickly the remedy can be applied to the part or location affected be it yield, percentage or capacity, with grade. A head miller worthy the name, as developed in this article, is a pretty good type of a man, and the country affords many such instances, and such and everyone, I sincerely believe, has earned his laurels by hard, interesting, tireless labor, with a full determination to succeed.

FORWARD SELLING BY BRITISH MILLERS.

OF late there have been fewer complaints in the flour trade regarding "throwing up," says The Miller of London, to use a term which has the double advantage of being well understood and milder than repudiation, but it may be that in these days of ever sinking prices, millers have grown accustomed to sell flour forward only to have it thrown back on their hands.

If there could be any real comfort in the knowledge that our misfortunes are shared by others, it might be a consolation to British and Irish millers to learn that in some parts of Germany forward selling has attained proportions which here as yet are happily unknown. It is currently reported that in some of the northern districts of that Empire, millers are to be found ready not only to sell flour eight months in advance, but to guarantee to the buyer the price current on the day of delivery, if the market should have weakened subsequently to the booking of the order. On the other hand, the seller takes no benefit from a rise.

Competition is, no doubt, keen enough among British millers, but happily matters are not yet at such a pass that a baker can say to his miller, "Heads I win, tails you lose," at least, not everywhere. In Liverpool and its district the flour trade appears to be on a sound basis in this respect, and doubtless it will be of interest to many of the visitors to Birmingham to know how far the millers of the South have been able to follow in the firm footsteps of their Lancashire brethren.

Probably no great center has suffered more than the metropolis. Quite recently a flour factor whose experience of London is both long and wide, mournfully shook his head and observed that a falling market must try the virtue of any flour buyer, adding, "Is it then surprising that the downward rush of the past eighteen months should have swept away the scruples of so many? Men who a couple of years back would not

have thought of throwing up what was booked to them, now do it without a blush." It is to be hoped that this factor was one of the confirmed pessimists who are never happy unless they can crowd the darkest colors on the canvas.

TURBINE EFFICIENCY.

By C. R. TOMPKINS.

THERE is no question but the various manufacturers of turbine water wheels have experimented upon various curves and forms of buckets and chutes until it would seem that as great a percentage of useful effect from a full column of water has been obtained as is possible. Still the loss in power at a partial supply is yet a serious detriment to the best turbine and affords a strong argument to those who still advocate the use of the overshot wheel for streams that are variable at certain seasons of the year. But few streams are inexhaustible and even some of the rivers that were formerly considered as such have dwindled down so that in the summer season in many places less than one-half the former supply is furnished, so that the mills and other manufacturing establishments located upon them, which heretofore had an abundant supply at all seasons of the year, are now obliged to economize severely. Experience has proved that to obtain the best results with any turbine wheel, the supply must be equal to the capacity of the wheel. For example, a wheel of good modern construction that has the capacity for using one thousand cubic feet of water per minute under a given head will return in useful effect from 80 to 85 per cent. But if the supply to the same wheel were cut down to one-half quantity, or five hundred cubic feet under the same head, it is very doubtful whether more than from 40 to 45 per cent. of usual effect would be realized. There is also another important point to be taken into consideration by those who are about to purchase a new wheel, that those wheels which have been tested and show a high percentage of power in the testing flume whether it be at Holyoke or any other place, are always tested at their best and under the most favorable conditions and with full water. But this is not always a safe criterion, for how many wheels are there in daily use that are ever run strictly with full water. There must always be a surplus to regulate the speed by, otherwise the speed could never be uniform or depended upon for regularity and the probabilities are that a large majority of wheels are running most of the time upon from three-quarters to seven-eighths water.

The term water instead of gate is used for the reason that the term half-gate or three-quarters gate does not always convey a correct idea of the amount of water used by the average turbine. Therefore the amount of gate opening is no safe criterion in estimating the quantity of water used, for most of the wheels at the present time are so constructed that the combined gate-openings represent an area nearly, if not quite, double that of the combined openings in the wheel, so that half-gate may really mean three-quarters, seven-eighths or nearly full water. Now in order to show that this is not exaggerated, take the following, which is quoted from the catalogue of one of the prominent manufacturers of turbine wheels who claim great proficiency for their wheels at partial gate and this may be taken as a fair sample for most others. The catalogue says: "With full gate, using 2,751.80 cubic feet of water, .867 per cent. of useful effect was obtained. With half-gate, using 1,996 cubic feet of water, the percentage of useful effect was .654 per cent. With three-eighths gate, using 1,621 cubic feet of water, .581 per cent. was returned." Now it requires but little figuring to show that in this case one-half gate discharges within less than sixty-eight cubic feet of three-quarters the capacity of the wheel at full gate, so that in this case half-gate really means three-quarters water. Again, at three-eighths gate, the quantity of water discharged being 1,621 cubic feet, does not by any means represent three-eighths of the full supply for $\frac{3}{8} \times 2751.87 = 1031.95$ cubic feet, which is 590 cubic feet in excess of that amount, for if the gate openings had been in proportion to those of the wheel, that is to say, only sufficiently larger to compensate for the friction of the water in passing through them, then at three-eighths gate it should have used 1,375.95 cubic feet instead of 1,996. Again, if we take the same average percentage of power from the quantity of water used

and apply it to the quantity of water that should have been used provided the gate openings were in proper proportion to the wheel, the percentage of power at half-gate would have been 40 per cent. instead of 66, and three-eighths gate would have fallen off in the same proportion, and probably less than 30 per cent. of useful effect would have been realized. In another wheel of different manufacture, the published test showed the greatest efficiency at a point about half way between three-quarters and seven-eighths gate and from seven-eighths to full gate the percentage of useful effect fell off about 10 per cent. Now there must certainly be something wrong in the construction of that wheel, otherwise if the gate openings were in proper proportion to the wheel the efficiency should gradually increase as the gate openings increased and the greatest efficiency should be at full gate. Now the probabilities are that the relative size of the gate openings were such that when it arrived at seven-eighths gate the wheel had all the water it could discharge and a further supply acted as a detriment rather than an advantage and in this case seven-eighths gate really was full gate or full water. If any one can explain this upon any other hypothesis we should be glad to hear it. The makers of this wheel, however, claim that as one of the peculiar advantages possessed by their wheel, viz., its greater efficiency at part gate, but the probabilities are if they should stop at seven-eighths of the gate opening and call it full water and then figure back upon the same principle, or, in other words, drop the gate opening entirely and figure strictly upon the actual amount of water discharged, that is to say, call one-half the water discharged one-half gate, three-quarters water three-quarters gate, and so on, the chances are that those same wheels as well as many others that have shown such remarkably high tests in the testing flume based upon the gate opening, when tested strictly upon the quantity of water discharged under those conditions, those remarkable results that are claimed upon half-gate tests would fall off materially and they would fall into line with many others that make no such pretensions or have never seen the inside of a testing flume, either at Holyoke or any other locality, aside from the mills where they are in use.

CANADA'S CANALS.

THE total amount expended by Canada for constructing and enlarging canals was \$52,210,121. In addition to the above there has been expended for renewals, repairs, staff and maintenance the further sum of \$1,310,893, making a grand total of \$130,520,924. The total expenditure for the year ending June 30, 1893, on construction account was \$2,069,573; for renewals, \$199,185; for repairs, \$204,756; for staff and maintenance, \$291,588. The net canal revenue for the official year was \$375,089, as against \$324,475 for the previous year, an increase of \$50,614. The amount of refunds and tolls on grain and other food products was \$40,032, as compared with \$52,270 in the previous year. The number of tons of freight moved on the Welland canal was 955,554, of which 528,569 tons were agricultural products.

On the St. Lawrence canals the quantity moved was 966,755 tons, of which 464,672 tons were agricultural products.

On the Ottawa canals the total quantity of tons moved was 647,011, of which all but 20 tons was the produce of the forest. There passed to Montreal by way of the Welland and St. Lawrence canals 261,244 tons of grain, and of this quantity 195,244 tons were reported. During the season a total of 268,830 tons of grain arrived at Kingston. Of this quantity Canadian vessels carried 159 cargoes, aggregating 150,000 tons, and United States vessels carried 89 cargoes, aggregating 109,000 tons. Only 4,341 tons were taken to Ogdensburg and transhipped to Montreal.

The "Soo" canal, which is in course of construction, is, by agreement with the contractors, to be completed by the 1st of July, 1894, and to admit vessels drawing 20 feet of water. The expenditure on this work during the past year amounted to \$590,000. For the first half of the current fiscal year there has been expended a further sum of \$768,546. The Minister states that there is every prospect of the completion of the canal during the coming winter.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

FLOUR POSSIBILITIES IN JAPAN AND CHINA.

CANADIAN millers have not yet shipped any considerable quantity of flour to the land of the Celestials, though initiatory steps in that direction were taken by Mr. W. W. Ogilvie about a year ago. With the C. P. R. over-land and water route transportation opportunities are favorable in some respects for the cultivation of such a trade. Recently North Dakota millers made a move in this direction, and six months ago sent a representative to Japan and China to spy out the land. This gentleman Mr. Geo. F. Wescott, had visited the land of the Mikado, ten years previous on another mission and had therefore a knowledge of the country which enabled him to compare conditions then with those existing to-day. He has just now returned from his flour mission and gives through the columns of the Northwestern Miller, information that may not be without its value to the millers of this country.

On his former visit to Japan, wheat flour, Mr. Wescott says, was used only in making sweatmeats, but this time he found all wealthy merchants and manufacturers using it, and in all places of over 2,000 inhabitants it was an easy matter to get wheat bread and pancakes. It was quite a common sight to see natives whose habiliments consisted of a cotton flour sack, with the showy stencil on the outside. Both the Japanese and the Chinese are largely influenced in their trading by brands used. After they once use and are pleased with a flour bearing a certain stencil, they will afterward invariably want that brand. To illustrate: One of the brands used for the flour sold by Mr. Wescott bore an elephant, and on returning to the points he first visited, he found that those who had used the flour were asking for the "elephant" flour. Some distinctive figure is needed in a brand, and, once established in their favorable estimation, the natives will apply their own suggestive name to it, and thereafter will call for it and no other.

Cotton sacks of 50 lbs. are used altogether. Prices current at the time Mr. Wescott was there were 1 yen 25 sen to 1 yen 45 sen per 49 lbs. A yen equals 48½c. in gold, and a sen 1-100 part of 1 yen.

The matter of exchange cuts a very important figure in the handling of all imports. Both Japan and China use silver money exclusively, and the depreciation in that metal, especially during the past two years, has made a great difference in the cost of exchange. For instance, in 1883, the yen was worth 89c. in gold, and it has steadily declined until now its value is only 48½c.

Yokohama is the great distributing port of Japan, and all the imported flour goes there, to be forwarded thence to its ultimate destination. The method of handling exports is to ship flour to the receiving firm, forwarding bill of lading with 60-day draft attached. On arrival of the flour, it is placed in store with warehouseman, and, for convenience of the consignee, he is permitted to draw it out as his needs require, if done within the sixty days, the payments for the different lots being endorsed upon the draft and warehouse receipt, as made. At the time Mr. Wescott was in Yokohama, the stock of flour there amounted to 25,000 sacks.

As showing the extent of the imports of American

flour into Japan during 11 years, the following official figures are given:

	Bbls.	Value in yens.
1893.....	60,108	322,642.30
1892.....	50,170	278,736.96
1891.....	63,295	342,503.53
1890.....	44,724	229,586.49
1889.....	30,356	193,029.85
1888.....	24,436	137,029.85
1887.....	20,194	95,193.58
1886.....	21,374	99,156.65
1885.....	20,902	102,075.66
1884.....	6,083	54,185.37
1883.....	5,683	55,628.30

The flour is measured by cattiees, 300 of which equal two barrels. In 1883, as already stated, the value of a yen was 89c. in gold; in 1893 it had declined to 54½c.

Practically the same conditions exist as to the prospective flour trade with China. Previous to two years ago, more or less of a trade had been built up in the northern part of the country, but the panic at that time, starting with the Barring failure pretty much ruined it. Hong Kong is the great centre of distribution, and the business is almost altogether in the hands of the Chinese merchants. From this port rivers and water courses extend to the innermost parts of the interior, and these supplemented by a system of canals, provide the cheapest kind of transportation. There are only two railroads in China, one being 16 miles long and the other 45. The boats on the waterways, especially in the interior, are stern-wheelers, propelled by man power. Mr. Wescott saw several, capable of carrying 300 people each, the motive power for which was furnished by 22 Chinamen working a treadmill. It would be a very easy matter to make trips along the rivers introducing American flour, and the expense would be small.

The cereals raised in both Japan and China are of inferior quality, and this is especially true of wheat. Such wheat as is raised—a soft, starchy and dirty variety—sells in Shanghai on the basis of about 76c. in Mexican money. When in Canton, Mr. Wescott paid a visit to the only flour mill there, the power for which was furnished by 32 bullocks. It had not been operated for nearly a year, the competition from American flour having forced the owner to close it. The latter, in lamenting over his unfortunate condition, said, that formerly he had 75 bulls feeding Chinamen, but now the Chinamen were feeding the 75 bulls.

The amount of American flour sold in Hong Kong last year was 2,300,335 sacks, of 50 lbs. Of this, 1,450,000 sacks went from San Francisco, and 850,000 from Washington and Oregon.

Mr. Wescott is confident that Japan and China offer an immense market for spring wheat flour, and only need to be judiciously cultivated to be made available. While Japan has so far been the heavier importer, China seems to offer much richer opportunities. The poorer classes in the latter country are naturally favorably disposed toward American flour, and use much more of it proportionately than do the wealthier Chinese, for the reason that it costs only about half what rice flour does. The matter of economy alone furnishes a strong incentive for them to favor it. Under these conditions, Mr. Wescott thinks, it will be a comparatively easy thing to introduce northwestern flour, particularly in China. Our products as far as known, stand favorably in the estimation of the people, and it will only require time, patience and systematic effort to educate them up to a point where they will appreciate spring wheat flour and use it extensively. A good export straight, Mr. Wescott says, would meet their needs in every respect.

The population of Japan in 1892 was 41,089,000. That of China is unknown, though it probably is over 400,000,000.

Mr. Wescott says, that while the Japanese, are as a nation, much more progressive and better educated, no finer scholars or sharper business men are to be found than among the Chinese merchants and manufacturers.

Both nationalities are honorable and square in their dealings, and, if they are treated fairly, no better class of people could be found with which to do business.

No duty is charged on flour imported by either Japan or China.

In reply to an inquiry in the House of Commons at Ottawa recently, Sir John Thompson stated that there are two rice cleaning mills in Canada, employing 75 persons.

PRE-EXISTENCE OF GLUTEN IN THE GRAIN.

THE hypothesis that gluten does not exist directly in the grain, says the British and Foreign Confectioner, but results from the combined action of water and a special ferment, is supported by Weyl and Bischoff.

These chemists maintain that every cause which impedes fermentation prevents the formation of gluten, and then that flour, heated during some considerable time at the temperature of 60° C., and treated with a solution of sea salt of 15 per cent., gives no more gluten. In a "Memoir of Flour," presented to the Academy of Science, Paris, Balland demonstrated that it is possible to obtain the gluten in this condition by placing the flour at a temperature of 100° C. during eight hours.

The researches of W. Johannsen also led him to an opinion contrary to the hypothesis of Weyl and Bischoff. However, he adds: "The hypothesis of a ferment has become more probable from another experiment made by Kjeldahl at the Carlsberg Laboratory. There is, in fact, a great analogy between the influence of the temperature on the action of the ferment first studied by Kjeldahl and the preparation of the gluten."

Working at zero no gluten is obtained, but at an increased temperature a constantly increasing quantity is obtained to a maximum of 40° C. Above this temperature the gluten tends to diminish.

As an example take the following series of experiments:

Portions of one ounce six and one-half drams of flour are heated at different temperatures; afterwards one ounce, one dram of water are added and heated to a corresponding temperature. After half an hour's rest at this temperature, they are washed on a hair sieve with the following result:

Temperature. 0, 5, 10, 15, 25, 40, 50, 60, 70.

Weight of humid gluten.—0, 6, 10, 11.5, 13, 15.5, 11.5, 7, 4.

In December, 1890, Balland resumed the experiment of Kjeldahl, and at a more recent date he managed to separate the gluten from the flour kept several days at 8° C., making the paste and working with water at 2° C.

The gluten was also obtained from paste made with water at 75° C., and washed by hand with water at 52° C. (kept at this temperature in a metal vessel suitably heated). Thus the same flour gave

27 per cent. of humid gluten at 2° C.

27.6 per cent. of humid gluten at 15° C.

30.0 per cent. of humid gluten at 60° C.

In this last case the gluten is softer, and, on the contrary, harder in the first.

If the flour is left in a place for thirty-six hours under the disinfecting action of sulphurous acid, produced by the combustion of sulphur in the proportion of 2 ounces 1.863 drams per 1.038 cubic yards of air, gluten cannot be obtained in the ordinary manner, but if a paste is made with salt water, it can be readily isolated.

A similar result is obtained by mixing with the sulphurated flour a fixed weight of humid gluten well washed and obtained from ordinary flour, adding sufficient flour to make a proper paste; most of the gluten employed can be eliminated, and in the case all the gluten of the sulphurated flour.

FLOUR MILLS IN THE ARGENTINE.

FROM a report published by Dr. Gabriel Carrasco, late Minister of Agriculture in the province of Santa Fe, we gather that in 1893 there existed throughout the province of Santa Fe 85 flour mills, with a total daily output of 885 tons. Of these mills 77 were worked by steam, four by water, and four by horse power. In 1887 there were only 60 mills in the province, the remaining 15 having been constructed during the past six years. The exports of flour from the Argentine in 1893 were 3,617 tons; 1892, 18,849 tons, while exports of wheat were 29,605 tons and 407,109 tons, which shows that the amount of flour exported is less than five per cent. of that of the wheat. This is principally due to the high duties placed upon Argentine flour by Brazil, which at one time was its largest consumer.

Laura—I have heard, Irene, that Mr. Weetpit, the young Board of Trade broker, who comes to see you, is what they call a bear. Irene—(blushing vividly)—A bear, Laura? That doesn't begin to express it. He's a perfect boa-constrictor.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

A CRITICISM OF MR. J. B. CAMPBELL'S VIEWS.

To the Editor of the CANADIAN MILLER:

Sir:—Reading between the lines the theories of Mr. J. B. Campbell, of Montreal, touching Manitoba wheat prices and Canadian methods of transportation one can readily see that what Mr. Campbell is anxious for as much as anything else is a removal of trade barriers between this country and the United States. I quite recognize this that the MILLER is not a paper to be given up to a discussion of political questions and the question of free trade vs. protection is largely a political one after all. But as a miller there is this important business phase of the problem, that if trade barriers are to be removed to the extent that there shall be free flour between these two countries, then to the miller at least the cost will be too high. Our mills are finding it a hard fight to-day to get rid of their product when brought into competition with the extensive milling facilities of the United States, and where would we be if free trade generally prevailed?

Yours truly,

CANADIAN.

EXACT THE LAW AGAINST THE RAILWAYS.

To the Editor of the CANADIAN MILLER.

Sir,—I read with a good deal of indignation the report in the April MILLER of the position assumed by the railways against Canadian millers in drawing an unfair distinction between the freight rates of flour and wheat. If the case is, as you state, that the law knows no distinction between these commodities then why should we be mealeey-mouthed in dealing with the railways? There is too much consideration given these corporations in the present day. The Dominion Millers' Association have started a bold fight against the railways, but in it I believe they will have the united assistance of every miller. If forced to call in the law they should, it seems to me, marshal the united strength of the whole trade. I believe nothing will be wanting from millers, small and large, in this respect.

Yours truly,

JUSTICE.

MAKING SCRUB MILLERS.

To the Editor of the CANADIAN MILLER:

Sir,—On general principles the position taken by your correspondent "Industry" in the April MILLER, on scrub millers, is correct. But who helps to make scrub millers? Sometimes the very men who most resolutely set their faces against the scrub miller. I refer to the head miller. If he is a broad minded man there will be no scrub millers under his control, but if he is one of those narrow, 6 x 9 fellows, who is afraid if the second miller knows too much he himself will become a head miller some day, and perhaps, displace Mr. Head Miller, then expect to see a growth of scrub millers. I have seen these men and their whole plan has been to keep their assistants from learning too much. If the second miller is a strong minded, plucky fellow he will overcome his jealous senior somehow, but where one will grow up successful ten will become discouraged, grow careless and eventually become slipshod workmen—scrub millers.

Yours etc.,

FAIR PLAY.

WHEAT AT 35c. PER BUSHEL.

To the Editor of the CANADIAN MILLER:

Sir,—The lot of the Canadian farmer, as wheat prices have prevailed for a year past, is perhaps not the best one in the world, though it is unfair to talk of low priced wheat unless, as Mr. Watts remarked in the MILLER last month, some consideration be given to changed conditions generally and the lower prices of living and of production of wheat to-day. I am just philosopher enough, however, to believe that no matter how bad we may think our lot that it will usually be found that somewhere somebody else is worse off than we are. Manitoba farmers are, I suppose, getting less for their wheat

than the farmers anywhere else in Canada, an average, probably, of 45c a bushel, and yet a paper has come into my hands which shows the strongest quotations for wheat in Nebraska are 35c. This is at a point the same distance from Chicago as Manitoba is from Fort William so that the freight rate to Chicago should be, if anything, lower than the Manitoba rate. The strongest quotations for oats at the Nebraska point was 23c and corn 22c. This may be considered as rather cold solace to the Manitoba farmer, but there is something in it after all.

Yours truly,

GRAIN DEALER.

MEMORIES OF AN OLD MILL.

J. L. HARBOUR.

THERE comes to me to-night, like the sound of a far-away melody, the soft, rumbling of the mill-stones in my grandfather's old mill. It is a year since I saw the old mill, and the mill-stones have long been silent and fallen into disuse. But there are times, like the present, when I seem to hear their murmur with startling distinctness, and if I close my eyes I can see old Ben, the miller, going about, floury and white, with his miller's cap on his head. Like most millers, old Ben was thoroughly good natured, but there were limitations to this pleasing characteristic. He drew the line at any meddling with the wheat after it had once gone into the hopper, we children, who were wont to frequent the mill might extract all the wheat we wanted to chew into "gum" from bags and bins before Ben's eyes, but woe betide us if we "went to felling" with the wheat in the hopper. And just because it was forbidden us we felt that this particular wheat was the only wheat in the mill that would make good "gum," and we ran the risk of having old Ben "break our necks," as he daily threatened, by slyly climbing up and "hooking" the hopper wheat. I remember that there was a curious belief or superstition prevalent in the rural neighborhood surrounding the little town in which my grandfather's mill was located. It was popularly believed that any one afflicted with the whooping cough would be greatly benefitted if brought to the mill and shaken in the hopper, and I have a very distinct recollection of babies and even large boys and girls being brought to the mill for this purpose.

Old Ben used to call this "the biggest Tom fool performance on earth," but he had instructions from my grandfather not to refuse to allow children thus afflicted to be shaken in the hopper. We children used to witness this performance with awe because we supposed that there was more or less danger of the patient being drawn down between the millstones and instantly reduced to pulp. The patients themselves may have felt that this danger was imminent, for they always screeched lustily while in the hopper, to the disgust of old Ben, to whom that institution was, in some sense, a sacred receptacle.

What delightful hiding places and romping places there were in and around that mill! There was nothing but grain bins and old rubbish up on the fourth floor, and some of the happiest of my boyhood days were spent up there. We could play "hide and seek" for hours without hiding twice in the same place, and I remember that we used to play some kind of a marching game in which we all sang:

"Oh happy is the miller who lives by himself,
As the wheel goes round he gathers in his wealth;
One hand in the hopper and the other in the bag,
As the wheel goes around he cries out grab!"

There was always one odd boy in this game, and at the word "grab" every boy had to change partners, which gave this odd boy a chance to "grab" some other boy's partner.

Then we played another old game called "the weevily wheat," in which I remember there was this doggerel rhyme:

"I won't have any of your weevily wheat,
I won't have any of your barley,
But I will have the best of wheat
To bake a cake for Charley;
For Charley he's a nice young lad,
And Charley he's a dandy,
And Charley he's the very lad
Who drank his daddy's brandy."

This mill was in the center of a magnificent wheat producing district, and it was the largest mill in the

country. Farmers came from such long distances to have their wheat ground that they could not return the same day, and sometimes there would be a half dozen wagons and their occupants encamped for the night around the mill. Grandfather would always, on such occasions, send out hot coffee from his own house to these patrons of his, so there was general good feeling all around.

Very often the mill would run all night, and I would go to sleep with the pleasant sounds of its wheels and millstones in my ears. Often in "the dead of night" I would awaken and lie in my bed listening to that soft, low, rumbling sound, and wondering just what old Ben was doing.

There was a cooper's shop in connection with the mill, and here three or four elderly coopers planed and hammered and shaved barrel staves and set up barrels all day, and sang songs and told amazing yarns. The cooper's shop was a pleasant place on rainy days, and we used to tumble about in the shavings, or hide in the barrels.

Modern methods of milling are very unlike those in vogue in those days, but I am quite sure that I have never tasted sweeter or better bread than that made from the flour ground between the stones of that old mill. I am equally sure that life has never seemed any pleasanter or sweeter to me than in those old days in my grandfather's mill.

NOTES FOR ENGINEERS.

A CHAIN is no stronger than its weakest link, and a steam boiler may have some one spot weaker than other parts, and in estimating the safe pressure, the strength of this weaker part should be taken into account.

Factors of safety, as they are called by mathematicians, are used as a means of making allowance for unseen or suspected or possible weaknesses. For example, a boiler shell is made of plates the strength of which is known, but the riveted joint is weaker than the plate, and the fit of the rivets in the holes may not be perfect, hence some allowance must be made for unknown imperfections.

It is common to make a calculation of the amount of metal left after the rivet holes are cut, and of the metal in the rivets, and determine the supposed amount necessary to break the plate. A well designed, double riveted joint should, however, give 70% or nearly three fourths the strength of the plate.

Stays, and especially screwed stays, may corrode and soon become much weaker.

It is common to calculate the strength of the riveted joint and divide by five as a factor of safety, so that the working pressure is only one-fifth that required to rupture the joint. The factor of safety used for stays and parts liable to be corroded is larger, often as high as ten, so that when new these parts are much stronger than the plate joint.

In connection with steam boilers there is another way of looking at the need for using a factor of safety. The rates still in use were adopted years ago when the quality of the metal was much more uncertain than it is now, and when the methods of working the metal were more likely to injure its strength than is the case with those now used by first-class makers. We have now a better guarantee that the finished boiler will really be of the strength intended. If this be so, then that part of the factor of safety which was used to allow for uncertainty of the strength and workmanship is not now so necessary.

Boilers made of steel by makers having good appliances are now in use with a pressure where the factor of safety is four, and possibly even this may in time be reduced.

We are not arguing in favor of engineers taking greater risks in using steam boilers, but we are arguing that boilers which have been made in the most skillful way and of the best material should not be rated as being only equal to those made of poorer material and in a less skillful manner.

Mr. Alex. Dobson, of Beaverton, is installing in his mill an incandescent electric light plant, and will furnish light to the citizens who may desire it.



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THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

CANADIAN WATERWAYS.

THE important question of Canadian waterways, to which reference was made in these columns last month, when discussing Mr. Campbell's paper on transportation matters, has been receiving increased attention within the past month. In the House of Commons the subject came up for consideration on resolution of Col. Denison, asking that the canal now in course of construction by the Government at Sault Ste. Marie, the Soulages canal now being constructed, together with the other St. Lawrence canals and the channel of the river, where necessary, should be deepened to a uniform depth of 20 ft. The member for West Toronto, in a speech that showed careful preparation, entered quite fully into the advantages that this measure would give to the commerce of the country. He took vigorous ground against the old method of constructing the waterways only 14 feet in depth. The conditions of navigation had so changed of recent years that there were more than 150 vessels on the upper lakes, drawing more than that depth of water. One great gain that would come to the country in the deepening of the St. Lawrence and Welland canals, as Mr. Denison stated, would be to bring Winnipeg within 400 miles of the sea. In this effort to improve our waterways support was given to the contention in a speech from Mr. McKay, of Hamilton, who argued, that through improved transportation facilities, trade with the Maritime provinces would be encouraged and the question of canal toll rebates would be solved. Dr. Sproule, member for East Grey, in favoring the motion, pointed out the benefit that the deepening of the canals would prove, particularly to the farmers, by giving them competition in freight rates. The saving of expenses of transhipment would of itself be a great consideration to exporters. Mr. Coatsworth, representing East Toronto, joined in supporting the resolution of his colleague from the western section of the city. He considered that freight rates would be cheapened by this proposed improvement of our waterways. If the government were not likely to take hold of this work, he thought a private corporation might at least construct a canal from Lake Ontario to Georgian Bay. Sir James Grant considered the Ottawa ship canal to connect Lake Huron and Montreal, one of the very first projects that ought to receive consideration. The views of Manitoba and the Northwest were voiced in speeches from Mr. Davin and Mr. Martin. The former considered it most important to the interests of these newer provinces

that the cost of transportation be cheapened. Mr. Martin said that nothing would tend to cheapen the cost of carrying the products of the Northwest to the British markets more than the deepening of the canals, so as to allow ocean vessels to load at Port Arthur for Liverpool. Unless the cost of transportation could be reduced very considerably there would be no money in Northwest farmers raising wheat. Mr. Martin expressed the view that the Northwestern states were interested in this question and he thought that an arrangement might be made by which the United States would share the expenditures.

That the government will take any action in the matter at the present time is hardly likely. As suggested in our comments on the question a month ago the expenditure on public works has reached a point that makes the government timid, especially at a time when commerce, generally, is depressed, to take any active steps in the direction indicated by Col. Denison's resolution. When the matter was discussed at another time the Minister of Canals stated that the project would cost from \$80,000,000 to \$100,000,000, but Col. Denison in his address quoted the estimate of Engineer Cortel, of Chicago, that the work can be done for \$67,000,000 and it is claimed that the St. Lawrence canals can be deepened to a minimum depth of 20 ft. for \$27,000,000.

After all, these are not enormous figures when the incalculable advantages in the development of the country are placed as an offset against the sum. We do not know, in fact, but that our position, is much like that of a business man, who may have reached a point in the history of his business where things must stand still, or more likely go back, unless he is prepared to make a forward movement. In the Northwest Territories, we have undoubtedly the greatest grain growing country on this continent and every year its value must become greater to us. But if the prices to be obtained for this golden grain are not to run better than they have for the past year or two development in this direction must come to a standstill. And if the Northwest is not to be developed as a grain growing country, then where is its hope of development?

Some of the likely advantages of deepening our canals are given in these terms in an article in the News: "The cost of shipping butter, cheese, cattle and food products generally from this Province to Great Britain would be reduced; the profitable interchange of Ontario flour for Nova Scotia coal would be made possible; and grain from the Northwest, instead of being sent via Buffalo and New York to Europe would be shipped by way of Port Arthur, Collingwood and Toronto, thereby giving business to our transportation companies, population to our cities and improving the home market of the farmers of this Province."

The value of Canadian waterways is appreciated by those who have studied the question outside of our own country. Captain McDougall, who has made his name somewhat famous as inventor of the Lake Superior whalebacks, has always contended that the most feasible route for the shipment of grain and flour from Duluth to Great Britain is through Canadian waters. The suggestion of a canal through New York finds little faith with him. The Captain's idea is taking some root in Congress, and it is understood that a resolution is being prepared, proposing an international commission between the United States and Canada with a view to co-operation in a system of canals and waterways between the great lakes and the ocean. Commenting on this matter the United States Miller remarks: "Unless means are soon invented for transportation other than by car or vessel, a waterway by some route is only a question of time."

As a contribution to this subject the government figures that we give elsewhere in this issue of the MILLER on Canadian canals will be found useful.

THE following story is told as illustrating the dullness in the flour trade. Recently a buyer came up to a well-known receiver and asked, "Have you a choice and really strong winter straight?" "Yes" answered the receiver, "I have." "Well then," said the other, "mix me up a dough, I want to throw it." To say that the would-be seller was not greatly amused goes without saying.

EDITORIAL NOTES.

A Campbellford miller is credited with having purchased, recently, spring wheat in Chicago as an experiment. The cost laid down in his mill, duty paid, figured out about the same as Manitoba wheat, but the yield in flour making fell short. A Chicago milling journal, commenting on the transaction, says: "The decreased cost of transportation compensated for the duty; but someone must have lost on that wheat, for it must have come nearly as far from its place of production as the Manitoba wheat."

A SUGGESTION comes from a correspondent of the Northwestern Miller that the present is a propitious time to commence a campaign of education among the farmers, to induce them to use low grade flour for feeding purposes. It is thought that this plan would relieve the market of much of the stuff that is really now causing so much depression in the flour market, and as a result it might be expected that wheat prices would improve. The American Miller remarks on this point that the use of any great quantity of low grade flour for feed purposes would bring it into disrepute with those who now eat it and strengthen the demand for wheat.

THE view expressed in the MILLER last month, which was to be credited to Mr. J. R. Dodge, that India is not likely in the future to cut so important a figure as a wheat competitor in the British markets, is confirmed in the view of the Liverpool Corn Trade News. This journal tells us that every year the use of wheat in the East is spreading and that it will not be many seasons before India will cease to export wheat. In all recent calculations of the wheat outlook, India has been viewed as an important element. It must be admitted there is lots of competition outside of that country, but it will be that much of a gain for wheat growers and millers in this section of the world for India to count out.

SOME late reports from Manitoba are not at all encouraging to a large wheat crop the coming season. The weather in the early spring opened out favorably, but this was followed later by a spell of winter weather and cold rains with less or more frost. The effect has been to make the season late for seeding. In some sections, of course, where light rolling soil is to be found the ground soon comes into shape for seeding, but looking over the field generally, conditions are rather blue. Late seeding means late harvesting, and in the Northwest this is risky to any crop. So it looks, as far as the present is concerned, as though Manitoba might have a short wheat crop. Perhaps this will not be considered an unmixed evil.

THE ingenuity of the business man is tested when hard times strike him. If he is tied up in one direction, he is compelled to exercise his wits to get free at some other point. We referred last month to the fact that it might be that wheat and flour losses at present prices could be leveled up in some measure by the transforming of bran into coffee. At least some ingenious millers were experimenting with success, it has been said, in this line. It is a common practice in all sections of the country to feed wheat with a profit to hogs. And the suggestion comes now from another source that there is money for the miller in our large centres at any rate by creating an adjunct to his milling business in the shape of a paste factory. The making of paste for marketing is not a new scheme in certain European districts. Paste is in constant use by wall-paper houses, paper box makers, carriage trimmers, printers, book-binders, trunk makers, picture frame concerns, cigar makers, bill posters, and many other concerns. In the large metropolitan cities people make a business of manufacturing paste and supplying it to these people, but in the smaller cities the practice is hardly known. The suggestion is that millers in our cities of from 50,000 to 100,000 population, and even in smaller districts, go into the business. One who has looked into the matter says it is quite surprising the very large quantity of flour that is consumed a year in the making of paste. So much for paste making as a side line, and it is in the side lines, in the present day of keen competition, the most money is being made.



SPEAKING of the proposed scheme for a twenty-foot waterway from Lake Superior to the seaboard, said William Craig, of Owen Sound: "Quite a number of schemes have been proposed, but many of them are utterly impracticable. In my opinion the only sensible and practicable plan for accomplishing the end in view is by using the St. Lawrence river itself for that purpose, by sinking concrete caissons at the different falls in the river and locking around them, and I question very much if there has not been more money spent on our present canal system than would have completed the above scheme, which would give any depth of water and would be good for all time. I would also suggest the use of the Niagara river on the same principle, as the proper route of entering the upper lakes. This improvement of the St. Lawrence and Niagara rivers would, I should suppose, have to be undertaken by the Governments of the United States and Canada paying the cost in proportion to the number of citizens of each country who would be benefited by the work."

* * * *

"MANY men of many minds" is an apothegm one hears frequently quoted, and illustration of this I am constantly finding as I move around among the men engaged in the grain and milling trades of the country. Even on questions where one would suppose that perfect unanimity of opinion would exist we discover widely different ways of viewing the same question, thus proving the correctness of another frequently quoted axiom that there are two sides to every story. It is to be expected that in meeting with millers I would find the question of freight rates, as between wheat and flour, and which is now being actively dealt with by the Dominion Millers' Association, a subject of conversation. Every miller out of his experience can show you the disadvantages under which he labors in being compelled to pay a higher rate of freight for wheat as flour than if the wheat alone were being shipped. "But," said one of the best known millers in the country, and whose experience has been extensive, "it is one thing to know that an evil exists and another to adopt a really practicable way of removing it. This question of distinction between rates of wheat and flour has been a grievance of the trade for a great many years. The present is not the first time that our railway managers have been pressed to make a change. I have no love for the spirit of greed that too often influences railway corporations, but so far as this immediate question is concerned one answer comes from the railway people. During the winter term the Grand Trunk find it necessary to keep Portland open as a port of shipment, but to do so they must charter vessels to arrive at that point, otherwise they say they would have no guarantee of a regular service. This being the case they must have freight sufficient to payingly load these vessels. The time of sailing draws near and nothing is more natural than that the railway should commence to dicker for the carrying of a certain amount of merchandise to ensure a paying trip. This can be done with wheat or other grains as cannot be done with other classes of merchandise. For one thing a measurable quantity of grain is required to place in the hold of the ship. No other merchandise will fill in so readily in the same manner. Then wheat differs from almost every other commodity in being an article of speculation. Dealers are always to be found ready to buy wheat on speculation, if some little inducement can be held out, and this inducement comes from the railways in the shape of the offer of special freight rates. A cargo of grain, besides, can be assured the company on very short call. As a miller I am sure I would not like to agree to send any large quantity of flour just whenever it might be wanted, on speculation, in the same way. So it comes to be the old story, what are you going to do about it?" With a merry twinkle in his eye, said my milling friend: "If I

were disposed to enter into reminiscences of the grain and flour trade of the province, going back perhaps into the early eighties, as I might do, I could let the men of the present day into the secret of some rich deals between grain firms and the railways, and where the grain men by no means came off second best either, but I must withhold myself just here."

* * * *

"TRADE conditions," said Mr. J. L. Spink, the well-known miller, and treasurer of the Toronto Board of Trade, with whom I chatted the other day, "are more peculiar than at any commercial period I can recall in my business experience, and I can go back quite a few years in the commerce of the country. Whilst I am, probably, the antithesis of a pessimist, it does look to me sometimes as though the world was sadly out of joint. Here we have a greater amount of distress in all parts of the world than has been the case in many a long year and at the same time the market is fairly glutted with wheat and flour, the very articles that go to make the staff of life. What is to be the outcome of the grain and milling business it is most difficult to say. Every business man expects—and he gets it whether he expects it or not—periods of unusual dullness. When these times come he quietly rests on his oars, knowing that a turn in the tide will come. This is the way we have all been feeling in regard to wheat and flour, but no turn in the tide comes. It looks as though wheat prices might drop to 50 cents after the next crop is harvested and then there will be a greater quantity of wheat on the market than buyers for it. We are likely to carry over into the new cereal year nearly, if not fully, as large a surplus as was placed on record in July, 1893. If on top of this there is to be a crop anything approaching as heavy as the past few years, see what an amount of stuff there will be for sale; and all this looks quite likely. Even if the crop is short here there is going to be a large increase in supplies in wheat from the Argentina, India and other foreign points where wheat growing is being prosecuted with a great deal of vigor. And yet after all I do not know that conditions in wheat and flour are much worse than in other lines of trade. It is only the other day I was talking with one of the largest wholesale grocers in the city, and he said it was remarkable how low down in price everything was at the present time in his line of trade. The iron trade is just about as depressed. We know that owing to unfortunate circumstances, if from no other cause, there is no encouragement to the cattle dealers. Perhaps we have conditions here that do not help to improve wheat prices. We can feed our grain to cattle if there is a large demand for cattle, but when this avenue of business is at a standstill it reacts on the grain trade to a measurable extent. So it is that one line of trade rests upon another, a very good object lesson to people who are disposed to be saucy and independent. We are, all of us, dependent in a considerable measure on others and our positions are certainly influenced largely by environment. But I guess we will live through it all," cheerfully closed this bright and active member of the Canadian milling trades.

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Though the fight may not be an easy one, I find that Canadian millers are very determined on pushing their case against the railways in the matter of a difference in freight rates as between wheat and flour. The section of the Railway Act on which they depend for strength reads thus: "No company shall make or give any special toll, rebate, drawback or concession to any person; and any company shall, on the demand of any person, make known to him any special rate, rebate, drawback or concession given to any one." As Mr. M. McLaughlin has said: "The matter is one in which every miller is interested. They may not be directly interested as exporters, but indirectly they are affected as millers; for the success of milling in Canada depends on an export outlet for our products. Millers who formerly exported and are now not able to do so, on account of the freights, are to-day catering for Canadian trade, the increased competition resulting in the cutting of prices. If the railroads could only see it they would themselves be at an advantage if they would stop giving these terribly low rates, which they from time to time give on wheat." The invidious character of these rates is illustrated by the Millers' secretary, Mr. C. B. Watts,

who tells of a miller from the West, who found that the rate on flour from his point was 23¢ per 100 lbs., while at the same time it was only 14¢ per 100 lbs. on wheat to Liverpool. Another way in which I learned these distinctions in freight rates operated against the miller is, in enabling British millers to buy wheat at so low a figure that it pays them better to import the wheat and grind it in their own mills than for British flour handlers to buy wheat on this side of the water. For example, Bell, Sons & Co., of Glasgow say that transactions have been reported in No. 2 red winter wheat for shipment from New York at equal to about 60¢ per bushel, which is a figure that distinguishes conspicuously against Canadian millers.

QUALIFICATIONS AND TESTS OF ENGINEERS.

EVERY engineer and fireman ought to know perfectly well, without the necessity of any elaborate calculating or theorizing, what results will ensue should he overload his steam engine, his boiler, or any of the machinery under his charge, and he would not be compelled to call in the services of most expert engineer to tell him clearly and concisely what would occur under such conditions. He would know that in the vast majority of cases he would be subjecting himself to the possibility—in fact, high probability—of a speedy breakdown, and before that event actually transpired, to endless trouble of every description, all the results of poor judgment, or unfortunate necessity, which led him to work his boiler, engine, or machinery up to double, or perhaps treble what it was intended for.

Every applicant of an engineer's license should be prepared to answer all questions that will show that he is mentally well equipped to provide against possible disaster. He should be well skilled in the construction, care, and manipulation of pumps, injectors, inspirators, all the devices by which the boiler is supplied with water. He should be familiar with the use of the gages in use for determining pressure of steam, or the quantity of water in the boiler. The safety-valve should be under his care, always ready to perform its functions. Then he should have some idea of the difference between fibrous and crystallized iron; should be able to tell when a boiler had become weak and needed repairs, and have the courage to say so, and refuse to fire it. He should have skill sufficient to enable him to frequently inspect the boiler, and determine if the factor of safety is enough to insure absolute safety. He should be able to take such care of the boiler, that large or dangerous deposits of scale and mud are not possible; also, should know what to do when "priming" or "foaming" is evident. He should inform himself as to the effects of corrosion, internal scale and deposits, improper setting, impeded circulation, and improper steam and water.

FAVORS CANADIAN BARLEY.

WITHIN the past few days it looks as though the barley men of New York state might be able to carry their point in the Senate and once more have the door opened for Canadian barley. Various conferences have been held between the brewing interests of the Empire state and the representatives in the House from there. The New York brewers depend on Canada for their supplies of barley, and with a nominal duty, they feel confident of securing the big end of the brewing trade of the country. Western brewers draw their supplies mainly from their own farmers and can get along without Canadian barley. It is here the fight in the Senate rests, the Eastern men at the present time feeling hopeful of the issue closing with the barley schedule satisfactory to them.

Clean wheat need not be closely scoured wheat. Thoroughly scoured wheat, passed over a magnetic separator, should clean wheat in so far as it is then free from loose impurities of greater or lesser size, or greater or lesser density than itself. We depend upon the scourer to free and get rid of *adhering* impurities, and these impurities may consist of dust, *puzz*, smut, bran scales. These removed, we have clean milling wheat, but their removal is the rub. We scour too closely, or we do not scour enough. If too closely, the treatment is quite apt to show evidence of unevenness in an excess of break flour; if not closely enough we are quite likely to have a specky flour.—Milling.

CLEANING WHEAT IN LIVERPOOL.

THERE is no doubt that we could continue "cleaning" wheat until it was perfectly skinned, writes a contributor to *Milling of Liverpool*. A great deal of dust which comes from both brush machines and scourer is bran dust pure and simple. By constant rubbing we make the bran thinner, and this rubbed-off bran constitutes much of the impurity we get in the latter part of our cleaning processes. This can be easily seen when the dust from the various machines is blown into separate catchers. That from the separator and aspirator will be dark and practically loose, extraneous matter, and so easily blown out; from the scourer it will be finer and better color; and from the brush machine best of all. But still, after the wheat has left the brush machine and has passed up elevators and along a worm, it yields up a further quantity of still finer dust, showing clearly that so long as there is friction there will be dust, or what we call impurities, although it is simply powdered bran. A knowledge of this fact may help us some day to amend our cleaning methods. It has, in fact, already, for many millers find that a good washing beats all the scrubbing, and yet this washing is not a new thing. We practiced it here in Liverpool, and we knew all its virtues before the advent of roller milling, and here to-day it is carried to the greatest perfection.

In some good mills the wheat which requires washing goes through a system of cleaning similar to the foregoing, the reason chiefly being that the impurities absorb water so freely that they are very difficult to deal with in the wet state; besides, they clog up the machines and cause endless trouble, so that it is best always to precede washing with a separator and aspirator. The barley is taken out before working, because it is considered that the rough friction of the whizzer, or centrifugal drier, breaks off the ends, and thus renders it more difficult to separate on the cylinders. There is, however, not much in this theory; still in the case of wheat which has a large quantity of barley mixed with it, like Kurrachee, a double cleaning with cylinders is none too much. We may, in straining after one effect, unconsciously attained another of which we had no notion.

The newest methods of washing and conditioning overcome in some respects the objections relating to frictional cleaning, for now it is the practice in some mills to wash all wheats, with, perhaps the exception of the English. This is a continuous process, beginning with the washer, thence through the drier or conditioner, and following that a single scourer right into the grinding garner or direct on to the mill. It is claimed for this that the wheat is thoroughly cleaned; then it is properly conditioned or tempered, after which the scourer removes any outside discoloring matter without materially abraiding the bran. This is all very well, but one drawback to general washing is the difficulty of always getting the wheat in good working condition again. Nobody questions or doubts the value of water in cleaning wheat, but it requires great care in doing; and one thing which will contribute toward success is rapidity of treatment in the wet state—that is, not to allow it to absorb too freely, or it will be found that most of the so-called "driers" belie their destination. The fact is, wheat which is thoroughly wet can only be dried very slowly, the kiln floor and twelve hours' exposure being the only effective means. I have had wheat, which had been under water in a ship, on an automatic drier for a couple of days without getting it anything like dry. But, of course, in the case of wheat for grinding, it is in the water only long enough to get rid of the dirt, and has no time to soak. What water has got into the skin is the very thing required to condition or temper it. This tempering process can be greatly improved by allowing the wheat to remain a few hours—say about twelve—before grinding. If left too long, it is likely to give up damp and also turn sour; hence the necessity for great discretion and carefulness.

Conditioners—or driers, as they are sometimes called—are of various makes and shapes. In some, steam pipes are used, over which the wheat travels in a downward course. These are by no means new. In others the wheat travels over plates heated with steam, either being propelled or falling by gravity. Others are heated with a furnace, having a fan to draw the hot air through the wheat, which travels through a revolving cylinder, the wheat being constantly lifted up to the bottom through the current of heated air. In others, again, the air is heated by contact with steam pipes; and still in others cold air simply is driven through the wheat. In all of them the wheat is cooled, after being heated, by having a current of cold air sent or drawn through it. The reason for cooling is that the heat having opened the pores, and by withdrawing the moisture made the wheat damper, the cold air has the effect of closing them and also hardening the tissues. It is said, however, that there is no passage for moisture between the endosperm and the outer skin—no sweat glands, in fact—but yet we know that by simply heating wheat we can draw moisture to the outside; and this is the very thing the American millers

do, preferring that method to water. It is a fact also that wheat after it has been wetted, becomes actually wetter after being heated; so the moisture must come from some part of the interior, even though it may not be actually from the center.

THE PROPER LOAD UPON BELTS.

SOME considerable interest has been excited among engineers by a report of a series of tests of belting in a machine shop, and the conclusions drawn from these tests are the subject of some controversy. The great difficulty in drawing conclusions from tests of this character is to apply the results to places outside of the place they are made, says the *Journal of Commerce*. In the case mentioned the tests cover a period of nine years, and were made in a large machine shop, and from the observations made the experimenter has sought to draw conclusions applicable to all classes of belts.

The observations were made upon shifting belts and belts driving the cones of lathes, both of which are regarded as very hard on belting of any kind. To take the results of these tests and apply them to ordinary driving would certainly result in providing a belt large enough for all purposes, but engineers will question the advisability of putting in a very large belt for a certain work when that work could as well be done by a smaller one. The conclusions drawn are that the speed of the belt should not exceed 4,500 feet per minute, and that the pull should not exceed 54 pounds per inch in width for double belts.

So far as ordinary belting problems are concerned, this is both a much lower speed and load than engineers have been willing to put on belts, and must add considerably to the cost of installation of the plant. In practice, however, the ordinary run of belting is not submitted to such severe strains or at all liable to injury, as shifting or cone belts are. It is always safe to add to the estimated size of a belt a certain amount of any unforeseen happening. Many engineers are willing to do that; to figure out what they consider the proper size of a belt and its proper speed, and then to make the belt somewhat larger than their figures call for, and thus be sure and be on the safe side, so that the belt shall give no trouble. But it is questionable if this is a proper way of establishing a rule for belting, however much might be said for it on the ground of preventing trouble with belts in actual operation.

To apply to ordinary belting the rules governing the severe service of shafting and cone belts is undoubtedly to make the belts larger than there is any need, and we can see no justification in it, or in any scheme that proposes to use an excess of material simply to be sure and have enough. The experiments noted are interesting as a record of the life of certain belts in a machine shop, but the conclusion cannot be applied very satisfactorily to any other kind of service.

The whole matter of the strength of belting is wrapped up in some uncertainty. No tests of belting can ever be made that can be universally applied, for there are so many different conditions in the problem, and these conditions appear from the manufacture of the belt, and the degree of care and quality of material, clear through to the use to which the belt is put. Experiments are difficult to make, for they must cover a long term of years, and any conclusions drawn from a short observation must be very little better than surmise. But it is necessary to establish a direct set of experiments to obtain some data on the matter, for engineers can watch the performance of different belts from time to time, and where a belt is giving excellent service an effort can be made to put in a new belt that will do service as the old one has done. This has been the general practice, and from it engineers have established different rules, but nearly all of them call for a smaller belt than is proposed by the late experiments we have noted. And no trouble has resulted, either in the care of the belt or in lessening its life, to use this higher load to the inch width of belt.

Our regular mill practice will be found to average a pull of 65 to 70 pounds for each inch width of double belting, and while it is always safe to say that a lower strain will be easier on the belt, yet no difficulty has been experienced from this practice. Where belts give trouble we believe that the difficulty will be found, not in fact that they have too much strain upon them, but in carelessly made and laced belts, and a lack of care in putting up and using them.

LEGAL DECISIONS.

ARTHUR V. GRAND TRUNK RAILWAY CO.—By the Railway Act of Canada a railway company has power to divert any water course, subject to the provisions of the Act; but in order to entitle themselves to insist upon the arbitration clauses of the Act, the company must, according to the Court of Queen's Bench, show upon their registered plans their intention to do so. Every proprietor on the banks of a national stream has the right to use the water, provided he so uses it as not to work any material injury to the rights of other riparian proprietors; but so soon as he uses it in such a way as to diminish

the quantity or quality of the water going on to the lower proprietors, or to retard or to stop its flow, he exceeds his own rights, and infringes upon their's, and for such infringement an action lies. The defendants built an embankment which entirely cut off the plaintiff's access to the water or stream by diverting it from his farm. Held, that it was the fact of the defendants having diverted the watercourse, not the fact of the plaintiff having sustained damage from their doing so, that gave him his cause of action; and the proper mode of estimating the damages was to treat the diversion as permanent, and to consider the effect upon the value of the farm that the permanent abstraction of the water should have.

CURRENT COMMENT.

THERE are eighty-seven flour mills in the district of Castellamare di Stabia, Italy, and 213 paste manufactories at Gragnano and Torre Annunziata, which turn out on an average 65,726,760 pounds per year, worth \$2,308,716, of which nearly 20 per cent. is exported to the United States. Italian exporters of macaroni receive a drawback on that made from foreign grain by presenting their statements at the custom house.

IN Germany anything in the shape of food adulteration is sharply punished. To sell wheat flour containing a particle of rye, or the reverse operation, is a great offence in the eyes of the law. Not so long ago a baker in a large way of business, was sent to prison for selling a 10 per cent. admixture of bean flour. A sensation has been caused by the recent proceedings taken against a baker at Halle on the Saale. Some rye bread seized by the police on his premises was submitted to the town analyst. The latter reported that some loaves, although ostensibly pure rye bread, were baked simply and solely from wheat flour.

WILL wheat growing pay in Australia? Discussing this question, a writer in the *Australian Miller* observes that the wheat lands in Australasia are not, as a rule, rented by occupiers, but are freehold, being purchased from the State by deferred payments. They are worth from £2 to £5 per acre. Real estate loans can be obtained at 5 to 7 per cent. The average rental is from 2s. to 5s. per acre per annum. The farm laborers get from 15s. to 20s. a week, with board, and work ten hours a day. There is little manure used; its cost is about £6 per ton. The same writer goes on to say, wheat-growing in Australia pays; its production is decreasing in old districts, but increasing in new districts.

AMERICAN millers who export to China, and other countries of the far East, are beginning to feel the competition of the large modern roller mills which British enterprise has built at Bombay and Calcutta, in India. That country has an exportable wheat surplus of many millions of bushels annually, and finds that it is more profitable to export wheat in the concentrated form of flour than in the grain.

Some have been disposed to question, says the *American Miller*, the statement, which we made some time since, to the effect that hard times affected the consumption of flour but little, and individual instances have been cited to show that less flour was being used than in good times. It is doubtless true that there is less waste of bread and flour in hard times than when people are prosperous; but we still insist that the aggregate consumption is affected but little. In Great Britain, where it is easier to keep track of such things than in a domain like our own, the consumption of bread is remarkably uniform. The consumption there for the last year is placed at 5.7-8 bushels per capita. Beerbohm estimates the consumption at 17,600,000 bushels per month in May, June, July and August; 18,800,000 bushels in September, October, March and April, and 20,000,000 bushels in November, December, January and February. Hard times in England always noticeably affect the consumption of meat and beer; actual figures are obtainable from the government on this last article, but the consumption of bread seems to be affected but little, if at all.

Six barges loaded with 129,000 bushels of wheat for W. W. Ogilvie, have reached Montreal, the first consignment of grain to arrive there this season.



Office of the CANADIAN MILLER,)
May 10, 1894.)

THE GENERAL SURVEY.

IT must be admitted that an analysis of the size of wheat stocks on hand for the month just closed, contrasted with 1893, and four or five years previous, does not afford much encouragement to a fulfillment of President Van Horne's two dollar wheat prophecy. Allowing the pendulum to swing, perhaps, to the other extreme, there would seem to be more reason to rest results on the prediction of a local grain dealer and miller, who, within the past few days, stated that if the new crop should nearly reach the figures of last year, that with the enormous surplus of stocks now on hand, it would be as difficult to sell wheat at 50 cents the coming season as it is to-day to find buyers around 60 cents.

Bradstreet's has gone quite fully into this question in a late issue. The fact is recalled that total stocks of available wheat in the United States and Canada, both coasts, on April 1 last amounted to 98,367,000 bushels, fully 10,000,000 bushels less than was reported available on April 1, 1893, one year before. "The significance of recalling these totals," says this authority, "lies in their being compared with the corresponding totals for May 1 this year and 1893." It is shown that United States and Canadian available wheat stocks on May 1, 1894, while smaller than those held at corresponding points a year ago, are not as much smaller as those held April 1, 1894, were smaller than those of a year previous. Go back two years, to May, 1892, and it is learned that these stocks are 40,000,000 bushels in excess of the stock of that period, 53,000 bushels larger than in 1890, more than 55,000,000 larger than those in 1889, and 44,000,000 bushels larger than on May 1, 1888. Of the ability of the country, therefore, to meet all calls between now and the harvesting of the next crop, there is nothing to cause worry.

If a comparison is made of supplies in and afloat for Europe on May 1, 1894, with corresponding dates of previous years, the situation rather than showing signs of relief becomes exaggerated. The figures for May 1, 1894, show 79,230,000 bushels, as compared with 77,592,000 bushels on April 1, 1894, showing, as Bradstreet's remarks, that Europe is continuing to moderately increase supplies of this staple food product. Compared with total European supplies afloat and on shore May 1, 1893, the increase is 6,430,000 bushels, about 11 per cent. The extraordinary character of the situation is made more apparent when the excess of supply here, on the high seas, and Europe, is contrasted with the aggregate on like dates two, three, four and five years ago. Bradstreet's figures are as follows: Increase compared with 1892, more than 44,000,000, more than one-third; 1891, more than 75,000,000 bushels, about 80 per cent.; 1890, 94,000,000 bushels, an increase of 123 per cent.; and as compared with the total in the United States and Canada, afloat for and in Europe on May 1, 1889, the increase is 84,000,000 bushels, nearly 100 per cent.

Allowing that the same decrease will take place in stocks on this continent and Europe during June and July, as may be indicated from an average of the past few years, and this will be carried over, according to the figures here produced, on July 1, 1894, into the new crop year just about as large a surplus as was reported available at that date in 1893, when the total was 152,308,000 bushels, 50 per cent more than was held in July 1, 1892, nearly twice as much as on July, 1891, and more than twice as much as on the like dates 1890, or in 1889.

What the new crop will be cannot with certainty be stated so early in the season. It is thought that the acreage of wheat in the United States will be less than that of a year ago, by perhaps 20 per cent., but this will not necessarily mean any marked diminution in the size of the crop, as compared with last year.

The provincial government report, issued on 16th April, and which is published elsewhere in these

columns, does not give the most favorable account of fall wheat, but those, who have been over the ground since that date, tell us that a great improvement has taken place, and that in many places the outlook for a good crop could hardly be brighter.

In Manitoba seeding has been rather later than usual, and the drawback of excessive moisture is still being met, there having been more water on the prairie than in any year since the spring of 1882. These are conditions that will not be so encouraging to a large growth of wheat in the Northwest.

Crop reports from abroad tell generally of favorable conditions, and a large yield.

Prices continue as depressed as ever, and in actual trading little is being done.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—White and red 53c., middlefreights; spring 60 to 61c.; Manitoba, 72c. for No. 1; 71c. for No. 2. Trade Bulletin of Dominion Millers' Association, says: "Car wheat worth 63 to 64c. on track, Toronto, for fall wheat, street prices: fall 62c., red 61c. goose 58½c. Manitoba wheat: Have been buying No. 1 hard 72c. west, and 74c. east; No. 2 hard 71c., and 73½c. east; prices nominally, 78c. for No. 1 hard, and 76c. for No. 2 hard, via North Bay, and grinding-in transit, via Sarnia, 79c. per bushel asked for No. 1 hard. Hardly anything offering all rail." Montreal: No. 1 hard, Manitoba 78 to 80c.; No. 2, 73 to 75c. Chicago; No. 2 spring, 57c.; No. 2 red, 57c.; Duluth: No. 1 hard 61½c. for May; 61¾c. for July; No. 1 northern, 59¾c. bid for May; 60¾c. bid for July. Toledo: 56c. cash and May; 58¾c. for July; 59¾c. for August. St. Louis: 53¾c. for cash and May; 54¾c. for July; 55¾c. for August.

BARLEY—Toronto—In anticipation of favorable legislation from the United States affecting the market for barley, it is reported that in some districts, noticeably the Midland district, an increased acreage is being sown in barley. Locally the market is quiet. Little demand for malting grades, and feed is quoted at 39 and 40c. Oswego: market for Canada barley is dull and prices nominal.

OATS—Toronto—Demand steady. Mixed selling at 33½c. and white at 34c. Cars of white on track are quoted at 37c. Montreal: 40 to 41c. Buffalo: oats stronger; No. 1 white, 40¾c.; No. 2 white, 40½c.; No. 3 white, 39½c.; No. 2, mixed 38½c. Oswego No. 1 white, 37c.

PEAS—Toronto—Sales are slow, though prices remain firm. Prices are ruling at 54c.; white 55 and 56c. is being paid. Montreal 70 to 72c.

RYE—Toronto—Very quiet. 45c. is current price. Montreal 52 to 55c.

BUCKWHEAT—Toronto—Car lots quoted at 40c. to 41c. Montreal: 45c. to 48c.

THE FLOUR MARKET.

A TOUR among the mills and persons interested in flour milling indicates no change for the better. The sales are small, so far as local consumption is concerned, while export trade is about at a standstill. Said a leading exporter and miller to the writer a day or two ago: "My mill is closed down altogether. There is too much flour on the market. Of course I have a good supply of stock in shape to transform quickly into flour if an improvement in trade comes, but nothing points in that direction now." Our shipments to Quebec, Maritime Provinces, the Indies and Newfoundland are all of the lightest kind. Prices rule at same unprofitable figures. Trouble among the employes of several of the larger mills of Minneapolis was a means of closing down for a time these mills, and reducing the output as a consequence. Reports from this milling center are on a par with those from less ambitious points. Orders are small and in some cases quotations are being shaded in order to secure business. Last week Minneapolis mills ground 160,000 lbs. of flour against 206,630 week before and 159,160 in 1893. Bakers' are in main demand with exporters. Export shipments were 40,690 bbls. against 48,900 the previous week. As little in the way of encouragement is to be said of the British flour market as has been written for some time.

PRICES OF FLOUR AND MEALS.

Toronto,—Flour: (Toronto freights) Manitoba patent \$3.70 to \$3.75; Manitoba strong bakers' \$3.45 to \$3.50; Ontario patent \$2.90 to \$3.00; straight rollers \$2.60 to \$2.95; extras \$2.40 to \$2.50; low grades, per bag \$85 to \$1.00. Bran \$16.00 to \$16.50. Shorts \$16.50 to \$16.75. The Trade Bulletin of the Dominion Millers' Association says of Ontario flour: Sales of straight roller \$2.80 and \$2.90 and 85% patent \$2.85, and 80% patents \$3.00 f. o. b. for Lower Provinces. Bran \$14.75 and \$15.00 west and \$16.00 east; shorts \$16.00 f. o. b. Export markets some sales reported of straight grade at \$2.70 west and \$2.80 east per bbl.

Montreal,—Market very quiet. Patent winter \$3.50 to \$3.70; straight roller \$3.00; extra \$2.70 to \$2.80; superfine \$2.50 to \$2.75; strong bakers, Manitoba \$3.40 to \$3.50; spring patent \$3.60. Meals: granulated in bbls. \$4.40; in bags \$2.20 to \$2.30; standard in bbls. \$4.40; in bags \$2 to \$2.10. Bran \$19; shorts \$19.50; mouille \$22.

Halifax,—Hungarian patent Manitoba, \$4.35 to \$4.50; Manitoba strong bakers \$4 to \$4.20; Canadian pastry \$3.90 to \$4; 75 per cent. do., \$3.45 to \$3.60; straight roller, patent \$3.10 to \$3.20; superior extra patent \$2.75 to \$2.85; extra \$2.50 to \$2.65.

THE WORLD'S CONSUMPTION OF COAL.

A STATISTICIAN has attempted to determine approximately the world's consumption of coal. He estimates that in generating steam for engines aggregating 10,000,000 horse-power (some authors rate the world's engines as high as 20,000,000 horse-power) coal is burned to the amount of 12,000 tons per hour. For gas for lighting the consumption is not less than 10,000 tons per hour, and for gas for heating and motive power, probably 4,500 tons. In metallurgy the use of coal reaches about 9,000 tons per hour, and in workshops and factories, 5,000 tons. It is difficult to calculate the quantity employed for domestic purposes, but 55,000 tons per hour, or 1,320,000 tons per day of twenty-four hours seems to be an under-estimate. Placing the actual daily consumption for the entire world as low as 1,600,000 tons, we find that a solid cube of coal more than one hundred yards on a side is burned up every day.

ABOUT STEAM BOILERS.

DURING my twenty years' experience with steam boilers, says a writer in Power, I have taken note of the following points, which may be of interest to readers. A boiler should never be blown out while hot. Portable tubular boilers should stand at least twelve hours after the fire is out before letting out the water. Stationary boilers should stand long enough to allow the brick walls to cool. I usually let my boilers stand from 18 to 24 hours, and by so doing I keep the dirt in solution and can wash out without any trouble. In case there is any scale I use a boiler pick and a good scraper. When there is any lime in the water, the latter should pass through a good purifier before being pumped into the boiler. Water should never be pumped into a boiler cold, as it makes hard firing and allows all the impurities in it to enter the boiler. In case the scale is hard, and cannot be easily removed, saturate it with coal oil before filling the boiler with water. This will loosen the scale without harm to the boiler. A good skimmer properly attended to will do much toward keeping a boiler clean, but cannot be relied upon. All boilers should be once in two weeks, as they are often burned by relying on some automatic device for keeping them clean that fails to do its work.

Mr. J. D. Saunby, of London, Ont., the well-known miller and member of the executive of the Dominion Millers' Association, is named as a likely candidate in the Liberal interests for the Local Legislature.

The next meeting of the executive of the Dominion Millers' Association will be held in the Board of Trade Building, on Tuesday June 12. Millers having matters they desire to bring before that body are requested to send their communications to the Secretary, Mr. C. B. Watts.

VIEWS AND INTERVIEWS.

Speculative Flour Buying.

Flourbuying, despite all that may be said to the contrary, says the Practical Baker, London, Eng., is largely speculative as to quality and resembles very much the process of buying a pig in a poke. Some clever people profess to be able to judge flour from samples, but our opinion is that the only reliable test is a baking one. Having regard, therefore, to the fact that the only test used by nineteen bakers out of twenty, is that of the batch, there is considerable difficulty in apportioning blame or praise where two or three marks are used.

No Longer True.

Some of the proverbial sayings, which have come to be looked upon with the greatest reverence and to be quoted almost with awe, are, as a matter of pure fact, the greatest possible untruths. Take the following:

"The mill will never grind
With the water that has passed."

Stuff! We once knew an old miller whose mill was run by the water of a stream which could not be depended upon the year around. The reservoir, or supply source, emptied its water at a greater rate than that at which it was replenished in the dry seasons. The old man had a little steam pump rigged up and a line of pipe laid which conducted the spent water back into the reservoir and so used it over again and is using it yet. He never sings the song in which the above lines occur; he has no poetry in his soul, but he knows how to make some of the poets look very silly.

No Going Backward.

I can conceive of no good excuse for a miller who allows his mill to go backward, writes "Jasper" in Roller Miller. He should keep it up to a certain level of performance anyway. It is better, though, to be constantly bent on improving. But in seeking ways to improve he should not go impulsively into anything new, but proceed cautiously, never taking any step that he cannot immediately retrace should the result fail to meet his expectations. Some, less wise, would never in such a case think of returning to the condition just abandoned, but go right on from one experiment to another, until the system is impaired in a number of parts and the starting-point wholly lost sight of. A miller hears of a change made in a neighboring mill which produced greatly improved results. Upon making a like alteration in his own mill he finds, to his surprise and disgust, that it proves a failure. He knows, however, that it was a success in the other mill, and so, without stopping to reflect on the differing conditions of the two mills and their influence on results, he persists in vain efforts to duplicate the work of his neighbor. Such a miller calls to mind the true saying that "one man's meat is another man's poison."

What is Success?

It is a truism to say that we all aim at being successful. Yet I may ask, says Mr. Albert E. Humphries, an English writer, Who is a successful miller? Is it the man who, year in and year out, makes a thoroughly good sack of flour? It is hard to believe that a successful miller would turn out an indifferent, or, what is worse still, an irregular article. Yet it certainly does not follow that that quality constitutes success, for many a firm has made the best of flour and failed miserably. Nor does a long percentage of necessity imply successful milling. I have myself, for six months together, been able before now to turn out 74 to 75 per cent. of good flour from uncleaned wheat, whilst for another half year I have only obtained less than 70, and yet beyond question the low per centage represented much better, because more successful, milling than the high, all attendant circumstances considered. Nor does it of necessity follow that low working expenses indicate successful management. All of us would aim at keeping them down, but most of us would gladly part with a sprat to catch a mackerel. In short, the only true test of successful milling is furnished by the complete balance sheet and the profit it shows. It would not at all times be fair to judge a miller's capacity by the profits he

makes. Circumstances over which he has no control may be too much for him, but the fact remains that profit is the only true index of successful milling.

Scientific Milling

Whether or not milling is to be considered an exact science may be an open question. But this much in the opinion of a writer in the Milling World is clear: "There is no point at which the miller can really afford to be anything else than exact. His building and programming must be exact. His grain-buying must be exact. His cleaning, his breaking, his reductions and his purifications must be exact. The need for exactness does not end with the purely mechanical part of milling. The miller must market, advertise, sell, hold, deal and collect on exact lines, or he will fail in business. The mechanical part of the business is sufficiently exacting, but it is, after all, only a preliminary to the important work of getting rid of the product for more money than it cost to produce it. Does any miller object to this view of his business? What basis of objection can he offer? There have been times when certain millers claimed to grind for high art principally. The history of those times and the record of what followed them prove that milling is after all, done for the purpose of making money. The Hungarian millers were the "old masters" in the "high art of milling." So long as profit margins were comfortably large, the Hungarians could and did maintain that they ground, not alone to make money, but to "produce the highest grades of flour known on earth." What happened? Competition cut down the margins of profit. Then the Hungarians dropped from the non-paying "artistic plane" to the paying utilitarian plane of operation. Finding their great canvases unprofitable, they came down a peg and have gone into the business of turning out the more profitable, or at least the less unprofitable, chromos. The notable reduction made several years ago proved the intimate relations that exist between the so-called "artistic side" and the acknowledged "money side" of milling. The pressure of the flood of American flour on European markets taught consumers that only a certain degree of fineness in flour is desirable, and that to pay more for a greater degree of fineness is not economy. At the same time that pressure forced the Hungarians to do what they never would have done willingly. Today it is not easy, if it be at all possible, to find many millers "milling for art." The consumers have assumed the role of critics, and their dollars measure the situation for millers.

KIND WORDS FOR "THE MILLER."

OUR esteemed Canadian contemporary, the Toronto, Ontario, CANADIAN MILLER, has passed from the possession of Mr. A. G. Mortimer into the hands of its former owner, Mr. C. H. Mortimer. The change was made with the March issue of the journal. We welcome Editor C. H. Mortimer back into the milling-journal ranks and wish him success. The CANADIAN MILLER is a good journal, and it should have the support of every miller and manufacturer in the Dominion.—Milling World.

WE notice from the last issue of the CANADIAN MILLER that the same has changed hands and wish the new firm continued success and prosperity. The CANADIAN MILLER is a publication that millers of the Province can well be proud of. The new firm assures its readers that they will do all they can to improve this already bright and useful journal and should have the patronage of every miller in the Province.—United States Miller.

PERSONAL.

Mr. Andrew McFall, miller and grain merchant, of Bolton, Ont., died at his home on the 28th ult. Deceased had been sick for some time back, and, after a visit to a New York physician, it was hoped he would mend, but he gradually grew worse, and finally passed away. Mr. McFall will be greatly missed in Cardwell, where he has been a prominent and successful grain merchant and miller for years. Deceased was a man of kindly disposition, and a firm friend of the poor, who will miss his many kind acts. In religious matters he took a deep interest, being a member of the Presbyterian body. Politically Mr. McFall was a Liberal-Conservative.

A WORD OR SO ABOUT REELS.

CIRCUMSTANCES alter cases. Many of us quote this from time to time without full appreciation not merely of how true it is but of how often it is true. Circumstances are constantly greatly altering cases in nearly everything in our lives and work. One of the thousands of instances in the mechanical world, in which the same thing will produce different results under very slightly different circumstances, is the clothing of flour-dressing reels, and in fact of all kinds of rotating cylindrical or prism-shaped screens. The diameter of the reel or screen, as well as the height at which the feed strikes the cloth, modifies its action so as to produce variations in the diameter of the particles which pass through.

We all know that it is desirable to have the particles of flour or of middlings in a given cut-off of the same diameter, as well as sharp and free-flowing. I do not think that millers have given sufficient attention to the fact that if they have two reels of different diameters clothed with the same silk, or two of the same diameter running at different speeds, the product will not be of the same degree of fineness; nor that they have thought that if there are two of the same diameters and speeds but having the feed strike them in different places, the product will not be the same. Neither do they pay much attention to the fact that the same piece of silk will let several grades of fineness pass through it at the same point in its length, by reason of some of the particles passing through it at a point higher up than others. Of course where there is a cylindrical reel of any kind it will pass a larger particle in a radial direction than in one oblique to the radius; and where there is a prism, the side that is steepest will not let as large particles pass through as the side that is on the bottom or that has any other less inclination from the horizontal. Also, when a reel is running slowly it will let larger particles pass through than at a higher speed. This being the case we must expect to find in the same cut-off, particles of very differing fineness; this we often do; and we must also expect to find the angle at which the material is presented to the silk make a difference in the capacity of machine. This is also the case.—Mechanical News.

UNITED STATES WHEAT CROP.

THE following despatch from Washington, D. C., was published in the daily papers a few days ago: The people of Ontario who are interested in the outlook for the wheat crop in the United States will be interested in a statement made by a gentleman whose business is to gather information for one of the largest buyers of wheat in this country. He said that returns had been received at his office from the entire wheat-producing country of the west, and that the season had now so far advanced that it is most unlikely that any climate conditions could seriously affect the wheat crop. So he said, speaking with a good deal of seriousness of manner, that he feared there was little comfort for the farmers, because the indications now are that the wheat crop would be enormous, perhaps phenomenal, while on the other hand there seem to be but little ground for hope that the price of wheat would increase. To use his own words:—"Unless some sudden emergency arises somewhere else in the world causing a shortage in the crops, and an unusual American demand, this great crop of wheat is likely still further to depress the price. To be sure we are exporting flour. It is even going to South America, because American flour is of such quality that Chilian mills cannot compete with it. We shall maintain our pre-eminence as flour-makers, because the American flour mill plants are as near perfect as possible for machinery to be, and the product of them, so far as the best qualities are concerned, cannot be equalled anywhere in the world." Yet this man pointed out that such is the business stagnation, so far-reaching is the tendency to economize, and so low are the prices for wheat that to-day the very best, the superlative quality of flour, is put upon the market at \$3 a barrel. Notwithstanding that low price it has been found that thousands of American families are buying flour of a little cheaper grade.

Eight Canadian vessels are being loaded with corn at Toledo, Ohio, for direct shipment to Europe, via the St. Lawrence route.

Mr. W. W. Ogilvie, of the Ogilvie Milling Company, Montreal, and president of the Montreal Board of Trade, recently interviewed the Comptroller of Customs at Ottawa regarding the reduction of the duty on jute bags.

ROLL SUCTION.

By WILLIAM G. CLARK IN "ROLLER MILLER."

THE benefits derivable from a properly constructed and well-working roll suction are many and can be easily demonstrated in practice; indeed, it would be almost impossible to secure the highest results in a mill without suction on the rolls. I speak from tolerably thorough experience, having built and operated a number of different suction devices of my own invention.

My first was made of heavy galvanized iron main trunks, with the tributary trunks and the spouts from rolls of the same metal in lighter weight. I prefer to run the trunks above the rolls and connect to these by smaller spouts, because the hot air tends to rise and therefore a lighter current is required to draw it upward from the rolls than in any other direction, while at the same time less flour dust is thus carried away. This is the proof of a good suction, that it takes off all the hot air and the minimum of flour dust.

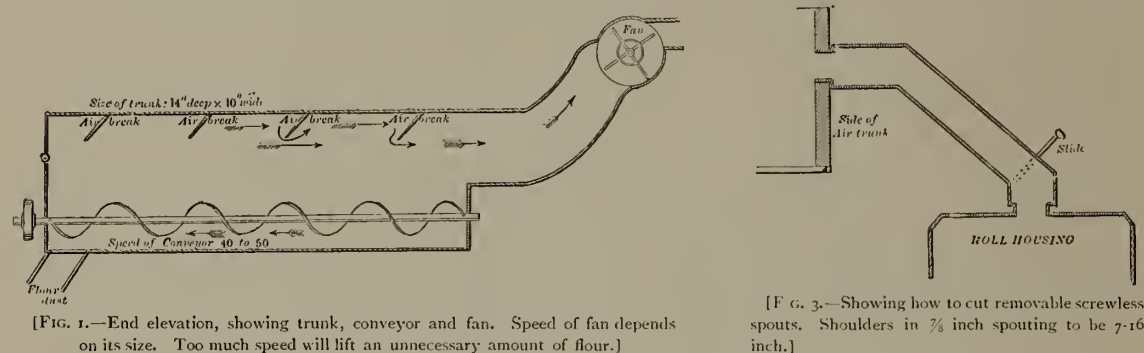
I find, however, one serious objection to the galvanized iron: it scales up and finally rusts out under the

into the openings without binding. This arrangement does away with the necessity of fastening the spouts up by screws, and leaves them free to be slipped in and out when they have to be cleaned. A slide inserted in the spout will regulate the opening to accord with the amount of suction required to keep the rolls cool.

A trunk built of wood as I have described has also this advantage over one of galvanized iron, that it cleans itself, while the latter has to be cleaned out by hand at least once a week.

The speed of the fan should not be greater than is actually necessary to draw off the hot air. On 20 stands of rolls I run my fan at about 900 a minute, with 12-inch blades. Avoid abrupt turns in the air spouts from main trunk to fan. Make the trunk quite as long as the line of rolls. If two lines of rolls are to be drawn from, place the trunk overhead between the rolls and run the spouts up on each side of it; if three lines, put in tributary air trunks and spout to them from the rolls, thus avoiding long spouts.

Suction on the rolls, besides making possible a cleaner



[FIG. 1.—End elevation, showing trunk, conveyor and fan. Speed of fan depends on its size. Too much speed will lift an unnecessary amount of flour.]

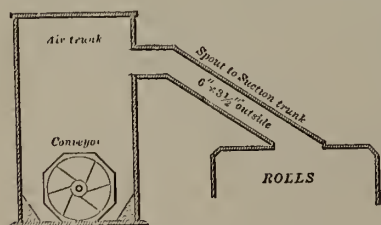
action of the moisture which is condensed on its inner surface from the hot air by reason of the cold air which passes over its outer surface. I therefore built a wooden trunk with a conveyor under it and had all the spouts heavily shellacked inside and out. Besides, I covered the trunks with paper, which is well known to be a non-conductor of heat and cold. The results have since been very satisfactory; the spouts free of sweaty or pasty flour.

The accompanying sketches will make clear the construction of my device and be a guide to any readers who may wish to arrange for themselves an efficient and economical roll suction. The main trunk (see Figure 1) is 14 inches deep and 10 inches wide, not including the height of the conveyor box, which should be determined by the size of the conveyor shaft. The flour that settles in the conveyor should, if possible, be carried to the end opposite that in which the fan is placed, as the weaker suction is less likely to lift the settled flour dust. The air brakes should be 5 inches deep and fastened to the top of the air trunk two or three feet apart; this arrangement causing a great deal of flour dust to settle in the conveyor and relieving the dust collector that works in connection with the fan.

I find the tubular dust collector the best thus far for this sort of work; it is not affected by hot air as are those collectors that contain exposed metal surfaces.

The opening in the trunk that leads to the fan may be in either the top or the end of the trunk, according to the position of the fan in the mill.

Fig 2 shows the end elevation and the manner of running. The spout from roll housing to air trunk should enter the trunk about four inches from the top.



[FIG. 2.—End elevation, showing how spout is run from rolls to air trunk.]

The roll may be tapped at either the side or the top of the housing, preferably at a point higher than the center of the rolls. The spouts should be about 6 x 3½ inches, outside measure, and be made of well-seasoned ¾-inch stuff. Two or three coats of shellac should be applied inside and out. Top and bottom should be screwed on. The end of the spout can then be shouldered about 7-16 inch deep and for a length equal to the thickness of the boards on the housing, and cut so that they will slip

mill, ensures by cooling the meal from the rolls an increase of capacity in the bolting of all products. Besides the rolls themselves will do more and better work through being kept from getting too hot for uniform grinding, and the roll housings and feeds will not have reason to sweat and warp.

Altogether, I regard roll suction as indispensable where really good milling is wanted. Its cost is trifling compared with its benefits, and it makes the operative miller's life better worth living.

THE BRITISH BOILER EXPLOSIONS ACT.

IN Britain there are acts of Parliament relating to the use of steam boilers known as The Boiler Explosions Acts, 1882 and 1890. Under these Acts the owners of steam boilers must report every accident of the nature of an explosion within 24 hours of its occurrence. From the last report to the Secretary of the Board of Trade by the Solicitor having charge of the workings of these Acts, we learn that the year ending June 30th, 1893, there were 72 investigations held. Some of these were merely preliminary inquiries, but 26 were formal investigations. Of the 72 accidents, 32 were from deterioration, or corrosion or some part of the apparatus having become defective. 23 were from ignorance or carelessness on the part of the attendant, 8 were from defects in design or workmanship, and in 9 cases the causes could not be definitely placed under any of these divisions.

It is interesting to note that the English law does not compel a boiler owner to place his boiler under the charge of a man holding any kind of a certificate, but the law holds the owner responsible, and in event of an accident he must prove that he employed a "competent" man. It goes further, and if at any of these formal investigations, it is proved that the accident was due to negligence on the part of anyone, whether attendant or owner, maker or seller of the boiler or its attachments, the law is strong enough to reach him, and inflict some form of punishment.

Here are samples from the report before us. No. 582.—Manufacturing engineers blamed for reckless conduct, and to pay £20 costs; No. 590.—Managing director blamed for neglect and ordered to pay £40, costs; No. 608.—Owner blamed for not employing a competent person and ordered to pay £85, costs; No. 623.—Owner blamed for want of proper supervision, and attendant blamed for neglect. Owner to pay £20, and attendant £5, costs; No. 651.—Owner held responsible for negligence of his engineer, and a blacksmith who

ignorantly advised owner as to the working pressure was blamed. Owner to pay 20 shillings and the blacksmith £20, costs.

We commend this to all parties interested in steam boilers. The acts have been in force a number of years, and have given good satisfaction. A similar act in Canada would do much to improve the steam appliances, and would make owners careful as to what kind of a man they employed.

The investigations refer not merely to what are usually called boiler explosions, but cover accidents to any connection of the boiler which is under steam pressure. The breaking of a steam pipe, the rupture of a tube or the bursting of a blow-off pipe must be reported, hence owners are much more careful.

Some of the accidents investigated were of boilers which were insured. The report says: "As regards the Boiler Insurance Companies, no cause has arisen in connection with the working of the Acts which shows any serious neglect on the part of their inspectors, nor has any blame been attached to them by the Court in any formal inspection which has been held during the year."

ENGLISH STOCKS.

BY the end of April the English wheat crop will be practically exhausted." So writes a responsible and influential miller in the west of England, says the Corn Trade News, using a phrase that should become historical, if the situation is half as bad as the cloud of witnesses, whose evidence follows hereafter, certainly testifies. With but two exceptions, viz., in Devonshire and in the East Riding of Yorkshire, where our correspondents estimate supplies are relatively large, there appears to be no district in England but where reserves are almost perilously small. Taking an average of the reports, it is fair to assume that the deficiency in farmers' hands, as compared with the corresponding date last year, exceeds 30 per cent., and that the percentage of the whole crop used for cattle food amounts to 20 per cent., in comparison with about 10 per cent., as is usually the case.

On account of the high price of straw, it is asserted in more than one district that a larger proportion of the crop has been already delivered than would have otherwise been the case.

To ascertain approximately the actual quantity of English wheat that may be depended upon between now and the end of the cereal year during 19 weeks, we will inquire what was delivered last season and deduct the percentage of 30 as aforesaid. Last season the quantity delivered between the 18th of March and 29th of July was 2,000,000 qrs., so that not more than 1,400,000 qrs. are likely to be delivered, at an average weight of 73,000 qrs. per week during the remainder of the season. As it is apparent that millers' invisible stocks have been drawn upon considerably during the last few months, there is every likelihood that for the remainder of this season there will be experienced a large and constant demand for imported grain. Taking the requirements in the aggregate they amount to 10,000,000 qrs. for the ensuing 19 weeks, towards which British farmers may be expected to contribute 1,400,000 qrs.; leaving the net demand for foreign at 9,200,000 qrs. or 484,000 per week. To help in meeting this demand there are merchants' stocks at the ports amounting to 2,146,000 qrs., which probably, however, cannot be drawn upon to any great extent without affecting prices unduly. Of the quantity on passage, large as it is in the aggregate, only 1,345,000 qrs. of it is on the way direct to the U. K., so that at present there is no plethora of breadstuffs in sight for this country.

AN ARGENTINE WHEAT KING.

THE "wheat king" of the world belongs to Argentina. He is an Italian immigrant named Guazone, and his broad acres are situated in the south of the province of Buenos Ayres. His crop of this season, which he has just finished harvesting, occupied an area of 66,720 acres, which is a trifle in excess of 100 square miles, and does not fall far short of the area of the Welch county of Flint, or of the Scottish county of Linlithgow. He numbers his workmen by the thousand, and he loads 3,500 railway trucks with wheat grain, all of which he grows on the share principle with his men.

NOTES ON BELTING.

THE best location for the idler pulley on high speed belts, says F. W. Taylor in the American Machinist, is on the slack side of the belt, and about one quarter of the way from the driving pulley. In this position it wears the belt far less than if placed close to the driven pulley, as is customary; and the tendency of the idler to guide the belt off the pulley, in case it is slightly misplaced or the belt stretches unevenly, is far less. The writer is aware that this is contrary to the accepted theories on the subject, and he has only arrived at this conclusion after repeated trials.

Belts drive satisfactorily when their shafts are 20 to 25 feet from center to center. If they are farther apart than this, the slack side is apt to flop about too much; and if the distance between centers is much less than 20 feet, they require tightening oftener than is profitable.

With main driving belts it is often desirable to use a longer distance from center to center than the above, so as to secure a greater arc of contact on the small pulley.

The faces of pulleys should, where practicable, be made about one-quarter wider than the belts which run on them, to allow for possible uneven stretch or running of belt, and a certain amount of chasing.

In establishments in which the shafting is run night and day by a single motor, it is frequently desirable to stop one or more sections during the night without stopping the rest of the shafting. In such cases it has been customary to use a friction cut-off coupling, or a friction clutch pulley, which is thrown in or out, as the case requires. These appliances are, however, owing to the number of their parts, more or less complicated, and are certain, sooner or later, to get out of adjustment and cause more or less trouble and repairs. The writer has found a far more elementary and satisfactory contrivance for this purpose to be a pair of tight and loose pulleys, to either of which the driving belt can be readily shifted while it is running at full speed, and he has had, during the past two years, lines of shafting transmitting as high as 300-h. p., successfully thrown off and on the main line each night and morning.

The two elements in this apparatus which are likely to cause trouble are, first, the loose pulley, and, second, the belt shifter. The loose pulley which I find most successful for this purpose has a loose bronze bushing in its hub, which is perforated with holes, and is automatically deluged with oil each time the pulley is stopped.

The writer used successfully, for shifting large belts at high speeds, two styles of belt shifters, both of which are old in principle, but which—so far as he knows—have heretofore been but little used. These belt shifters are, as usual, applied to the belt on the slack side, and as close as practicable to the driven pulley. The first consists of a pair of rollers mounted on a movable frame, and having their axes inclined one toward another, forming an angle of about 20 degrees. This frame is then placed so that the plane of the axis of the rollers is at right angles to the center line of the belt, and the belt passes between the rollers without touching either. Belts up from 20 to 24 inches in width are readily shifted by pressing one or the other roller against the edge of the belt, the action being similar to that of an ordinary forked belt shifter, except that the edge of the belt curves downward, owing to the inclination of the rollers, until the body of the belt touches the roller, and in this way the edge is prevented from burning and fraying out.

The second style will readily shift any width of belt whatever, and for wide belts, where space permits, is to be preferred to any other style of shifter. Two rollers, the length of each of which is rather more than twice the width of the belt, are placed with their axes parallel to the plane of the belt, each forming an angle of about 75 degrees with the center line of the belt. They are inclined, however, in different directions to the center line of the belt. When one of these rollers is pressed even with moderate force against the surface of the belt, it will move slowly and uniformly to the right until the other roller is removed. If the other roller is used, it moves in the same manner, but in the opposite direction. The action of this belt shifter, in starting a line of shafting into motion, is much to be preferred to that of any friction clutch, it being exceedingly uniform, smooth and free from jar,

It is undesirable to run a loose pulley for any length of time, however, under heavy belt pressure. Each head shaft, on which the tight and loose pulleys are mounted, should be coupled to the line which it drives with a flange coupling having a plate about $\frac{3}{4}$ -inch thick between the two flanges. When it is desired to stop the line of shafting for several hours in succession, the belt should be temporarily shifted to the loose pulley, the flange coupling should be opened and the distance plate removed, and the belt shifted back to the tight pulley, where it can run without danger from cut or hot bearings. A starting and stopping device of this sort is as durable and gives as little trouble as any part of the shafting. As shifting belts are ordinarily used, they are injured as much by running partly on the tight and partly on the loose pulley as from any other cause. It is, therefore, of great importance that each ordinary forked belt shifter should be provided with some appliance for insuring the belt being either entirely on the tight or loose pulley. We have found a simple and effective plan to be that of cutting two V-shaped notches in the edge of the slide to which the forks are attached, the same width each at the top as the face of the pulleys, and pressing a male V down into these notches with a light spring, the sides of the notches being made so steep that the male V could rest nowhere but at the bottom of one or the other of its mates.

Belts should be cleaned and greased every five or six months, just grease enough being put on to keep the surface of the belt moist and prevent it from cracking. It was found by experiment that every three months was oftener than belts required greasing. Belts will last well if repeatedly tightened under a strain of 71 pounds per inch of double belt, equivalent to 238 pounds per square inch.

It is very important for the life of belts, as well as to avoid excessive friction in the bearings, that they should not be overstrained; therefore, where the conditions permit, belt clamps should be used which are provided with spring balances for weighing the exact tension to which the belt is tightened, and a table should be carefully figured, indicating the strain to which each belt in the establishment should be tightened. In many cases, however, it is impracticable to use spring balance belt clamps in tightening belts, and in such instances it has generally been customary to guess at the amount of belt to cut out; the results of this guessing often prove disastrous both to belts and bearings.

It is safe to shorten a double belt $\frac{1}{2}$ inch for every 10 feet of length, if it requires tightening, when working according to the ordinary rules under a total load of 111 pounds per inch of width, and giving an effective pull of 65 pounds per inch of width. If it works under a total load of 54 pounds and effective pull of 26 pounds, it is safe to shorten the belt one inch for every 10 feet of length.

ONTARIO GRAIN.

THE latest bulletin issued by the Ontario Department of Agriculture and bearing date of April 16th does not give an over-promising outlook for fall wheat, though it is to be remarked that conditions have improved some since that date. In western and northern Ontario the promise is of a fair crop. The report is as follows:

Fall wheat.—This crop had entered a most crucial period, as correspondents wrote, and much uncertainty existed regarding its future prospects. Early in March fine, bright weather prevailed, and the protecting covering of snow disappeared, revealing the fields of wheat in a promising condition in most quarters. The latter part of March and the early part of April, however, was a season of alternate freezing and thawing, and the cold nights and warm days not only resulted in much "heaving" but also browned the tender blades, and left all but well-drained fields with an appearance anything but satisfactory. The situation at the time the correspondents wrote was as follows:—Fall wheat has been seriously set back by spring frosts and absence of warm rains. Should another week or two of unpropitious weather prevail much of the crop will have to be ploughed up or reown; but as the roots are vigorous timely showers and genial weather may carry the fields forward towards an average yield. Where the fields entered the winter with a good

top they are still vigorous and verdant, and those who practice under-draining rejoice in an encouraging outlook. The great fall wheat countries along Lake Erie send rather discouraging reports, and in the eastern portion of the Province, where the acreage is small, the prospects are equally poor for a good crop. In the Lake Huron group the County of Huron gives a cheerful report, while Lampton and Bruce are rather the reverse. The Georgian Bay counties reports are equal in tone, and on the whole the chances are nearly as good as usual. In the West Midland group favorable reports prevail over those of a less encouraging character, and the same may be said of the Lake Ontario counties. So far there has been an almost complete exemption from injury by worms or insects.

Rye.—What little of this crop is grown came through the winter in fair condition, although injured by ice. The area of winter rye is inconsiderable, taking the Province over, but here and there in the eastern counties some stout advocates of this crop are to be found.

Farm supplies.—There is not much unanimity of opinion regarding the quantity of hay, grain or fat and store cattle on hand. In three western districts of the Province the bulk of correspondents report a surplus of hay and wheat, and in some counties there are more oats than are needed for feeding and seeding. In the Lake Ontario counties there is but little hay to spare, and in the eastern and northern hay, wheat and oats are in store in only moderate quantities.

THE EXPANSION OF CHIMNEYS.

IT is seldom that facilities are afforded for the making of exact measurements of the expansion and contraction of a factory chimney. It is generally conceded that boiler chimney shafts should not be attached to the walls of any important building on account of the risk of cracking the walls by the expansion of heated brickwork, but data on the subject are scanty, and there are even persons who have doubts whether brickwork really expands or contracts when heated. An excellent opportunity of settling this question has recently presented itself in England. It was necessary to erect a casing of ornamental brickwork around a boiler chimney of 90 feet high, the inside of which was provided with a brick flue up to over one-third of its height. The near completion of the brickwork surrounding the chimney gave the opportunity of observing from the top of the casing any movement of expansion or contraction of the chimney itself. As the boiler fires were drawn on Saturday afternoon, and relighted on Monday morning, the chimney cooled down, and observations made from the top of the casing will show a contraction of the chimney of 5 millimeters, or 2-10 inches during that time. As the surrounding wall was still about six feet below the top of the chimney when the measurements were made, and the first 33 feet of the shaft remained practically cold on account of the air space between it and the centre flue, it may be taken that the length of the brickwork in which the expansion took place was about 50 feet. According to this a shaft 100 feet high would expand 4-10 inches when in use. It is probable that the expansion observed would have been 50 per cent. greater if the chimney had been allowed a longer time to cool down.

THE OLD WATER WHEEL.

It lies beside the river; where its marge
Is black with many an old and oarless barge,
And yeasty filth, and leafage wild and rank
Stagnate and batten by the crumbling bank.

Once, slow revolving by the industrious mill,
It murmured, only on the Sabbath still;
And evening winds its pulse-like beating bore
Down the soft vale and by the winding shore.

Sparkling around its orbid motion flew,
With quick, fresh fall, the drops of dashing dew,
Through noontide heat that gentle rain was flung,
And verdant round the summer herbage sprung.

Now dancing light and sounding motion cease,
In these dark hours of cold continuous peace;
Through its black bars the unbroken moonlight flows,
And dry winds howl about its long repose;

And mouldering lichens creep, and mosses grey
Cling round its arms, in gradual decay,
Amidst the havoc of men—which does not suit
That shadowy circle motionless and mute.

—JOHN RUSKIN.

INDIFFERENCE TO BOILER FIRING AND MANAGEMENT.

BY DANIEL ASHWORTH, MEM. AM. SOC. M. E.

OBSERVATIONS extending over a period of a quarter of a century in a practical and professional way have presented opportunities to note, in the greater number of manufacturing establishments, a continuous decline in the grade of service of those in the position of firemen and boiler room managers, this corps of operatives seeming, at least, to have remained in "statu quo." The evil has become so glaring and the results so palpably fraught with disaster, destruction and waste as to warrant an effort to call the attention of those who desire to progress, to the false and inconsistent position which they occupy by permitting such a narrow policy in management, so widely at variance with true economy ignoring directly that the better intelligence renders the more valuable, and, hence, more profitable service.

It goes without saying that, during the past ten years, the concentration of efforts by scientists and eminent mechanics looking to the more perfect development of the steam engine in its various types has produced results which challenge the admiration of the most critical in this line of thought. Within the same period, from every source, there have been a multitude of features in the form of designs and novel applications of boilers, all converging to the important factors of increased economy, efficiency and safety. In the engine sphere, condensing, compound and triple expansion engines, with and without jackets; in brief, seemingly, all the necessary refinements have received and are now receiving close attention. In the boiler domain there has been also the evolution from the plain cylinder type to the tubular, and from that through the multifarious forms of water-tube designs, each striving for a superior degree of excellence. The amount of research and practical application that have been and are being instituted in attempting to increase efficiency and economy, is such as to be incalculable. A retrospect of the past, viewed in the light of present results, shows that these efforts have been of an exceedingly fruitful character.

The development has carried with it the imperative advancement of those in charge of engine management to such an extent as to create almost anew this body of men. Such an intellectual advancement in the department of mechanics, the writer believes, is without precedent, and in every sense challenges admiration from every quarter. Notwithstanding these favorable features we are constrained to say that all this is somewhat like the play of Hamlet—with Hamlet left out; or, in other words, we are radically defective at the very threshold of this field, by reason of relegating the firing of boilers to the most ignorant of operatives; or, to put it in a plain way, there seems to be an almost unanimous idea that any one who can shovel and throw fuel is good enough for a fireman. Close observation and contact for a period of years, with numerous plants of varied character, increase the conviction of the writer upon this point. Recognizing, as we all do, that the furnace of the boiler is the prime feature and great initial point from which comes the source of power, does it not properly follow that if economy and efficiency are deserving of efforts in the advanced stages, as has already been pointed out, this is the very point that should be treated with every consideration of intelligence? Should not the fuel, furnace and boiler receive the thoughtful attention that the engine receives from the careful engineer? I think this will be accepted by every one interested in advanced ideas. No one, I think, will question the fact of the importance of the initial point of the boiler and its furnace, and that with mismanagement these other efforts of refinement are rendered, in many cases, completely void. It would seem so simple that argument would be unnecessary, were it not that on every hand the matter is entirely ignored, resulting in waste and destruction. We would ask—are not the efforts of the best furnace designers often completely set at naught by reason of the manner in which they are operated? Is it not a glaring fact that in all cities where smoke abatement has been and is being attempted, the great stumbling block is the low grade of intelligence and low grade of the boiler operatives?

In looking upon this subject from a mechanical and engineering standpoint, we are fully alive to all the requirements to give complete combustion and thorough

distribution of heat units, proportion of grate area and openings. Proper amount of air, conduction of the heated gases, all are carefully considered. When all is completed we have the wonderful spectacle of these conditions being turned over to the simple treatment of ram-jam shoveling and slice-bar operations. I claim that the fireman should know, at least, the elements of combustion, the importance of proper management of fires to produce the greatest results with the least expenditure of fuel. It may be said that the application of mechanical stokers makes intelligent firemen unnecessary, a point that is frequently (and I believe without thinking) claimed by those interested in placing such stokers. This is a great mistake, well known by those conducting tests, the results always being superior with the greater intelligence of the operator of the machine.

Within the past few years, in every community where cleanliness, taste and health are considered, there has come forth a crying appeal to the authorities to lesson the great evil of smoke in the atmosphere. In response to this, inventive genius has promptly come forward. The multitude of devices that have been perfected and put in operation furnishes ample testimony of this fact. Many of these, when properly operated, accomplish satisfactory results in smoke abatement, but no inventor has ever had the temerity to label his machine or furnace, "No skilled fireman required." Per contra, it is well known that the most intelligent fireman produces the best results, and it is also an undeniable fact that the best devices are set at naught by incompetent operating. The writer has been brought in contact with large fields of boiler practice, and in many cases, aside from other disqualifications, the firemen were unable to speak or understand a word of the English language. It may be said, as I have heard it said, that these men are not paid to think, but to do. Well, they do do. They will "do up" a coal pile, furnace and boilers with alarming rapidity. I say alarming to those whose views are broad enough to consider the initial and important points. On the other hand, it is a lamentable fact that there are a great number of men in official positions, as superintendents and proprietors of establishments, who seem to be utterly incapable or unwilling to note the importance for the necessity for a higher grade of labor in the firing and management of boilers.

One of the most surprising features in connection with this state of affairs is the tendency of those interested to place boilers claiming, among their numerous merits, that less attention is required for them than for others, precisely on the old exploded claim applied to engines, "No skilled engineer required." I have now before me a letter from a boiler representative, who claims that his boiler will give the utmost satisfaction with one-half the attention that others receive.

What is greatly needed at present is to lay aside the idea that any one is good enough to fire and manage boilers. When you engage a man for your office do you not require that he shall possess some qualifications for the position, and if aptness is shown do you not show appreciation by advancement to a higher plane, the interest being mutual? Why not apply this to the selection of firemen? As it now stands we cannot but exclaim, "Strange, what a difference there should be twixt tweedle-dum and tweedle-dee!"

There are many plants in operation where, by incompetency in this line the steam efficiency is greatly lessened, furnaces and boilers are working in neglected conditions, fuel is wasted and the community is begrimed with volumes of unnecessary smoke. In addition to these evils, lives and property are jeopardized. Unless this matter is considered and such action taken as will improve this corps of operatives, it would seem absurd to be continually reaching and extending into the higher refinements of steam engineering. Under these conditions do not the pertinent questions present themselves to the employers: Are we not occupying a false position by this indifference? Do we not retard the development of a class of labor which, by a recognition, by an appreciation, that some skill and judgment are required, would be animated by some spark of ambition to qualify for advanced positions? Is not this condition of affairs a gross inconsistency, nay, a mockery, in the face of the query put by those guilty of this indifference.

Why can we not get better men than this? In reply to that I would say simply, it is not sought on your part. Just as long as this class of operatives is looked upon as mere shovelers, throwers of coal and carriers of water, ignorance with all its attendant waste, destruction of property and general demoralization, will be prominent in the boiler department.

ROCK EMERY MILLSTONES.

THE use of rock emery for millstones is something quite new in the grinding line, and has only lately been accomplished. As emery stands next only to the diamond in hardness, the abrasive power of grinding stones made from this material is something enormous. The rock emery suitable for making these stones is found only in a few countries, the best coming from Greece, though the largest importations are made from Turkish mines. One great advantage about rock emery is that its surface never glazes, and consequently it grinds rapidly and steadily, at the same time producing little heat. Millstones made from this material grind to any degree of fineness with almost no loss of the abrading material. For especially fine work, from 60 to 150 mesh, this is of great importance, as hard substances can be reduced to this size without injuring the stones or cause them to wear away and give an irregular-sized product. These millstones are turned out for all kinds of mills and for a great variety of purposes.

A NEW INVENTION.

A NEW crank, which does away with the dead point, is the asserted invention of a French engineer. The crank-pin works in a slot cut in a steel disc fastened to the end of the shaft, and is pressed upon by a spring, which is so adjusted that at the ordinary working steam pressure it is held firmly in place. If, however, the crank be at a dead point, when the full pressure of steam is admitted into the cylinder, the spring is compressed, the crank-pin slides in the groove so as to assume an angular position to the shaft, and the latter begins to revolve. As the pressure of the steam in the cylinder, while the engine is in motion is less than in the boiler itself, as soon as the shaft begins to turn the pressure against the spring is relieved, and the crank-pin flies back to its usual position. The tension of the spring is adjusted as necessary.

CHAFF FOR THE DUSTIES.

First Mill Proprietor—"Yes indeed, sir, the times are very depressing, very depressing. Only yesterday I received a large foreign order accompanied with the condition that all the flour should be packed in five-hooped barrels." Second Mill Proprietor—"And what did they want of the extra hoop?" F. M. P.—"It was to enable them to whoop up the market."

Roller Mill—That was a great grind I got off on you the other day, Flour. Flour—Oh, go on with your chaff, you've got wheels in your head.

"Waiter!" "Yaas, sah." "Have you some nice wheat cakes and maple sirup?" "Yaas, sah; but, boss, I'd 'vise you not to eat 'em now." "Why not?" "Bettah wait, sah, till it's a leetle darker. De gloamin' is de bes' time foh to eat dem wheat cakes an' maple sirup, sah." "Why?" "Waal, you see, sah, de red ants done got into dat maple sirup, an' it's a good deal pleasinger to eat it jus' after dusk, sah."

Iowa corn has been making a political and horticultural record this season that justifies some tall stories. But it hardly warrants the following, which a recent arrival from the west brought with him: "I saw," says the recent arrival, "a man standing at the foot of a corn-stalk." "How big is your corn?" I asked the farmer. "I don't know," was the reply. "I just sent one of my boys up to see, and I'm worried to death about him." "Can't he get back?" "No; that's not the trouble. The corn-stalk's growin' up faster'n he kin climb down."

Anything that makes us take an unselfish interest in others makes us better. If there were no troubles to talk about some people would always be silent. One of the hardest things to get people to believe is that little sins are deadly.

THE NEWS.

CANADA.

—The flour mill at Arden, Man., is offered for sale.

—The flour mill at Neepawa, Man., is to be equipped with new machinery.

—W. J. Reed, of Reedsville, Ont., is making improvements to his flour mill.

S. Parish, flour and feed, South Edmonton, Man., has sold out to Juergens & Co.

—The Otonabee flour mill at Ashburnham, Ont., is to be put in running order shortly.

—Mr. Scott, of Paisley, Ont., recently shipped 1,000 bushels of oats to Hamilton, Bermuda.

—Mr. D. Goldie, of Ayr, has purchased the flour mill at Highgate, Ont., the price being \$11,000.

—Collingwood offers free water and exemption from taxes to anyone who will locate a flour mill there.

—The flour mill at Cobocok, Ont., with several thousand bushels of grain, was burned April 22nd.

—W. E. Ellis, of Trenton Falls, Ont., will build a 50-barrel flour mill at Vernon, B. C. He will also supply electric light to the town.

—R. D. Martin & Co's. grain elevator at Pierson, Man., containing about 12,000 bushels of grain, was destroyed by fire a few days ago.

—A canvas for stock for a joint stock company to establish a flour mill at Virden, Man., is meeting with considerable encouragement.

—The Allandale Mills, owned by the Messrs. Humphries, of Allandale, Ont., were burned to the ground a fortnight ago. The mill was originally built by Thos. Short. Loss about \$26,000; insured.

—The municipality of Oakland, Man., is desirous of securing the erection of a flour mill in that district. A \$5,000 bonus, free site, and a railway switch are offered as inducements.

—The partnership heretofore existing between Preston & McKay, millers, Whitewater, Man., has been dissolved and a new partnership formed under the style of Hurt & McKay, C. J. Hurt becoming a member of the firm.

—There is a well authenticated rumor going the rounds of the grain dealers' circle to the effect that a 2,000-barrel flour mill will shortly be erected in the city, and that a local miller will have complete control.—Winnipeg Free Press.

—The roller mills at Carp, Ont., have recently undergone extensive repairs. The contract for refitting was let to Messrs. Goldie & McCulloch, of Galt. The old engine has been replaced with a new Wheelock engine of sixty horse-power.

—The Lake of the Woods Milling Company will erect a grain elevator at Winnipeg, Man., to enable the company to buy wheat from the farmers at that market. A storage warehouse for flour will also be erected in connection with the elevator.

—The old and highly successful business of David Goldie, of Ayr, Ont., has been transformed into a joint stock company. The corporation are: David Goldie, John Goldie, G. E. Goldie, R. Nelson, of Ayr, and Hugh McCulloch, of Galt, Ont. Capital stock \$180,000, and the name of the new concern "The Goldie Milling Company of Ayr, Ont."

GENERAL.

—The journal of the Ministry of finance of Russia publishes a further report on the condition of the autumn-sown wheat up to March 27, according to which there is now much less reason than there was at the time of the last report to entertain any fear for the safety of the early crops.

—It is recorded that a miller recently sold in Chicago a round lot of fairly good bakers' flour for export at a price equal

to \$15.50 per ton, which is \$1.50 a ton less than was paid for barley screenings at the same time. Bran and ship-stuff were selling at a price not much below this figure. Oats were in good demand and worth more per pound than either wheat or flour. Such an abnormal condition of the markets will remind many of the old time millers of the days before we had the telegraph, low freights and unreliable government crop reports. Then prices were governed by local supplies and often bore as absurd relations as they have recently.

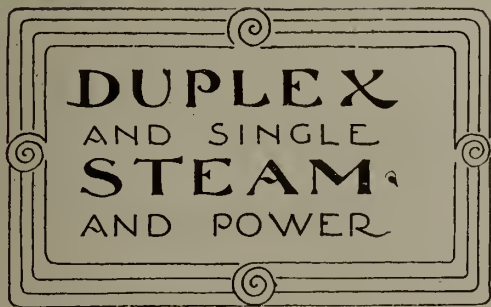
—Last year, according to The Miller, the United Kingdom imported 20,408,168 hundredweights of flour, against 22,106,009 and 16,723,003 hundredweights respectively for 1892 and 1891. Of this the United States supplied 17,995,601, 19,467,391 and 13,703,035 hundredweights respectively for 1893, 1892 and 1891. Canada 1,080,955, 1,359,120 and 1,029,243 hundredweights, and the Austrian Territories 1,099,614, 977,272 and 1,217,933 hundredweights respectively. Only 1,171 hundredweights were imported from Russia, 10,262 from the Argentine, and 2,800 from India.



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ROLLER MILLER—SINGLE—OPEN FOR engagement as first or second; good references. Address Box 37, Wroxeter, Ont.

MILLER—GOOD REFERENCES—EITHER first or second; reasonable terms. Box 50, Clarksburg, Ont.

AS HEAD MILLER—CAPABLE OF RUN-NING and improving the output of any mill; have references from prominent milling firms. Address Box 485, Mail.

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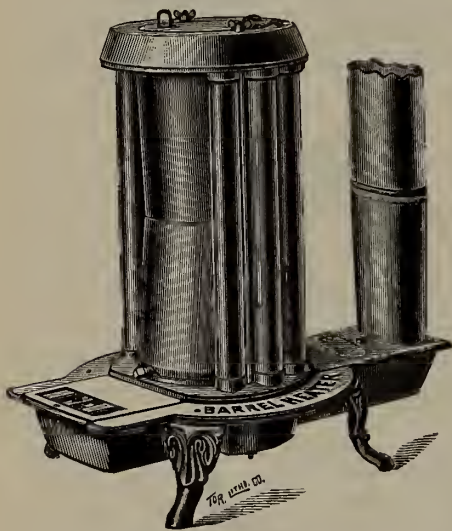
at a sacrifice, all the machinery, including the elevators and shafting, of a 50 barrel Goldie & McCulloch Roller Mill, built in 1889. Apply at the office of

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WANTED, A GOOD MILLER TO MANAGE a 75 barrel mill. Must be competent man and single. Address

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Uses no tobacco in any way. Best of references. State
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Sale of Dean Grist Mills

JUDICIAL SALE

OF THE

DEAN CRIST MILLS

SITUATE in the Township of Clinton, in the County of Lincoln, at the Master's Office, Court House, St. Catharines, on

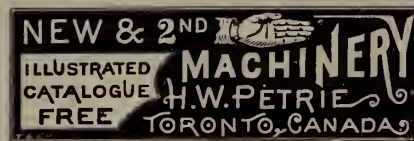
26th May, at 11 a.m.

The mill is a four story stone mill, with three run of stone—water and steam power. There is a miller's dwelling house on the premises. Two-thirds of the purchase-money may remain on mortgage, repayable in five years with interest at 6% payable half-yearly. Splendid farming country in vicinity of mills.

Full particulars may be had from Rykert & Marquis, E. A. Lancaster, or Cox & Yale, Barristers, St. Catharines.

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Dated at St. Catharines, 27th April, A.D., 1894.



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A Life Policy
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THE ONTARIO MUTUAL LIFE

ISSUES THEM ALL

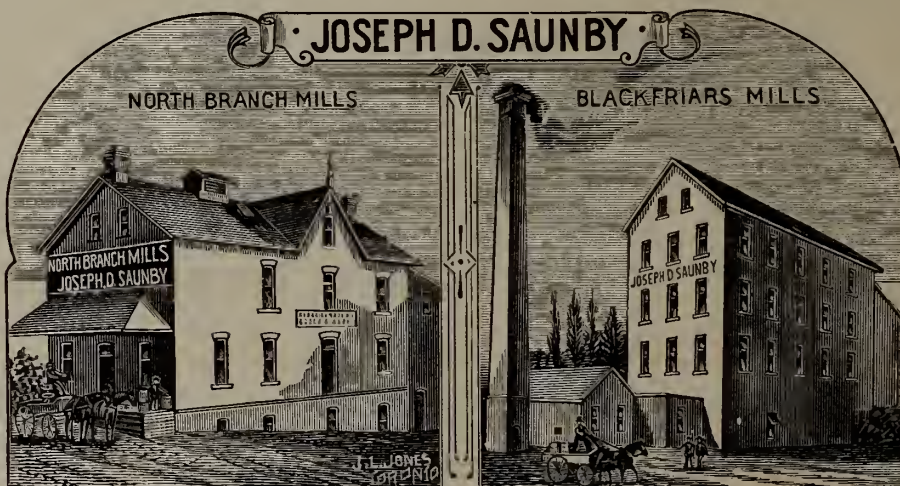
One 20-year Survivorship Distribution Policy embraces all the newest features, and is the best form of Protection and Investment money can buy. It has no equal. Guaranteed values, attractive options and liberal conditions.

A WISE AND GENEROUS PLAN.

Our Annuity Endowment Policy ensures a certain annual income to yourself during 20 years after maturity of the Policy or to your family at earlier death; and the Annuity Life Policy guarantee a sure income to your family during 20 years after your death; first payment immediate. The rates are lower than on ordinary plans.

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Brands :

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Chopped Feed . . .

In whole or car lots
mixed

~LONDON, ONT.~



BRANDS:

STAR : LINCOLN
CROWN
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SPARKLING RIVER



Unsurpassed for Uniform Quality



GREENFIELD MILLS + AYR, ONT.

D. GOLDIE, Prop.

Daily Capacity 500 Barrels

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Gibbs' Patent Dust Protector protects the nose and mouth from inhalations of poisonous dust. Invaluable to operators in every industry where dust is troublesome. Perfect protection with perfect ventilation. Nickel plated protector by mail, \$1.00; postage 5c. Circulars free. Agents wanted.

Gibbs' Respirator Co., 36 LaSalle St., Chicago.

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Is the Short Line to

SAGINAW AND BAY CITY

(Centres of the vast lumber interests of Michigan)

MT. PLEASANT, CLARE, REED CITY

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The last-named place reached by the Company's line of steamships across Lake Michigan.

The line thus formed is a short and direct route from

MONTREAL TORONTO

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To **ST. PAUL, DULUTH** and Pacific Coast Points.

This road traverses a section of Michigan with unrivalled advantages to settlers. Cheap lands, thriving villages and towns, well watered with streams in all directions: a market for every product of Forest and Field.

The policy of the "F. & P. M." is known to all travellers and settlers.

A. PATRIARCHE, Traffic Manager.

GENERAL OFFICES: **SAGINAW, MICH.**

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INSTRUMENTS FOR CLUB FEET, WHITE SWELLING, SPINAL CURVATURE, & ALL DEFORMITIES

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— Longfellow.

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DAILY CAPACITY

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HIGHEST QUALITY



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BAGS AND SACKS

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Original Designs for Brands Prepared Free . . . Printing in beautiful Bright Colors at Lowest Prices

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We carry the Largest and Best Assorted
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Always buyers of Medium and High Grade
Flour in carload lots

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THE CANADIAN MILLER,
Toronto, Ont.

THE CANADIAN MILLER

AND GRAIN TRADE REVIEW

NEW SERIES "MECHANICAL AND MILLING NEWS"

OLD SERIES, VOL. XI. } NUMBER 6.
NEW SERIES, VOL. IV. }

TORONTO, ONT., JUNE, 1894

{ TERMS, \$1.00 PER YEAR
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ROLLED OATS



STANDARD AND



GRANULATED OATMEAL

..... Made from Selected White Oats

SPECIAL TERMS MADE WITH
FLOUR MILLERS FOR RE-SHIP-
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D. R. ROSS, Embro, Ont.

Chatham Wired Hoop Co., Ltd.

Owner of the Patents for the Dominion of Canada

IS now issuing Licenses for the use of wooden barrel hoops with reinforcing metal band commonly called "the wired hoop." These hoops are specially serviceable for high grade cooperage, requiring strength and tightness, such as flour meal, cement, etc.



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LACE LEATHER

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Grist Mills ...

SUPPLIED

SPECIALLY

WITH

...High Grades

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MANUFACTURED FROM

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EVERY BELT GUARANTEED

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NORTH : AMERICAN : MILL : BUILDING : COMPANY, : LIMITED

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Line of Machinery WE MANUFACTURE

ALLIS ROLLER MILLS
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THE BROWN AUTOMATIC CUT-OFF ENGINES

The Best, most Economical and
Durable in the market

Another prominent Mill Firm endorses our Machinery and System :

...OFFICE OF...

~ J. W. COCHRANE ~

MANUFACTURER OF

CHOICE : FLOURS

GLENBORO, MAN., FEBRUARY 19TH, 1894

NORTH AMERICAN MILL BUILDING CO.,
STRATFORD, ONT.

GENTLEMEN,

I have much pleasure in informing you that the mill you built for me at this place is in full operation, and the flour is giving excellent satisfaction to our customers.

The mill started off without a hitch, and has not given a bit of trouble since starting, and the flour was up to grade almost from the start. The machinery and material furnished by you are first-class in every respect, and the millwright work done by the Johnston Bros. is unsurpassed.

The steam plant is first-class, the boiler has good steaming capacity, and the "Brown" engine works without a bit of trouble, smooth and quiet, and appears to have plenty of power, and I have much pleasure in accepting mill as first-class and fully up to rated capacity of 150 barrels per day.

Yours very truly,

J. W. COCHRANE.

WE MAKE Mill Building

A SPECIALTY
NOT A SIDE LINE

Full line of most modern and improved Machinery furnished for Mills of large or small capacity from basement to attic.



Prices as low as any in the market consistent with first-class Material, Workmanship Style and finish.



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Estimates, Plans and Specifications cheerfully furnished upon application.

All kinds of Rolls corrugated with promptness and dispatch



DUFOUR BOLTING CLOTH AND MILL SUPPLIES

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North American Mill Building Co., Ltd.

STRATFORD, ONT.

THE CANADIAN MILLER

OLD SERIES, VOL. XI. } NUMBER 6.
NEW SERIES, VOL. IV. }

TORONTO, ONT., JUNE, 1894

{ TERMS, \$1.00 PER YEAR
{ SINGLE COPIES, 10 CENTS

FLOUR MILLING AT LAKEFIELD, ONT.

Eight miles from Peterboro' is to be found the pretty town of Lakefield. It is an incorporated village at the head waters of the Otonabee river, for it is here the stream widens so as to be dignified by being called a lake.

Occupying a prominent place among the industries of the town is the flour mill of Mr. John Hull. A glance at the picture that we here give of the mill, and the water power that "makes the wheels go round" is evidence to our readers of the almost unlimited extent of this power.

Mr. Hull's mill has a capacity of 125 barrels daily, and is equipped with full roller and centrifugal process machinery. Mr. Hull has been a resident here 31 years, and the mills were erected in 1857, and came into his possession in 1864. The brands of flour manufactured are:—"Diamond Star," "Regal" and "Jewel." A market is found in the Maritime Provinces, Newfoundland and some is exported, but everywhere Mr. Hull's stamp is a guarantee of excellence. At the World's Fair Mr. Hull carried off a gold medal for his flour exhibit. Mr. Hull began his milling experience when fourteen years of age, and he is always at the post of duty; but all this does not prevent him taking an active part in municipal matters. At present Mr. Hull is a member of the village Council, and in this capacity, as well as that of a citizen generally, no man is more highly respected. In fact he has represented his constituency—with the exception of three years—since 1875, although he never yet solicited a vote.

BAKERS AND BREAD IN ITALY.

By OLIVE MAY EAGLE.

ON coming to live in Rome, I failed to assign the public baker his proper position in house-hold economy, because my only life has been passed in the Old Dominion, where a housekeeper's reputation depends upon the quality and variety of bread which she places before her guests, and where a cook is valued according to her skill in baking.

Naturally I was dismayed at the first site of an Italian kitchen with no provision for baking, and with only two or three small gratings filled with charcoal for cooking purposes. Twelve years of experience have taught me that an astonishing number of dishes can be prepared about these round holes, and that fowls can be roasted beautifully on the spit that turns by clockwork and is found in all kitchens. Small ovens for pastries can also be bought, but only fine cooks know or care about using them, since most delicious pastries of every known variety lie temptingly in wait at the corner shop. As for the rest, one soon learns to run to the nearest baker with the beet and potatoes, or with a favorite cake which he will bake for two sous—far less than the cost of extra fuel at home, to say nothing of the labor saved. True, the boy who brings home the roast often disposes of the brownest potatoes, and the cake is occasionally burned black on the edges, but then, housekeeping has its drawbacks everywhere.

In isolated country houses, bread is both made and baked at home, and in the hamlets inhabited by peasants who own tiny grain plots—I cannot magnify them into fields—the woman of the house makes bread once a fortnight, and either carries it on a board to the village oven, or else to a private oven built by several families in partnership. With these exceptions the mass of the

people, both in towns and cities, order bread from the public baker, who is, in consequence, an important factor in the general weal. The bread, whether in loaves or rolls, is baked in an old-fashioned brick oven which is heated by a blazing fire of twigs kindled within. When these twigs have settled into red-hot coals, they are shoveled out and put aside to be sold for use in braziers.

The oven is then carefully swept clean of ashes, and the bread is put in on long boards, the largest loaves being pushed further to the back, as they require greater heat. The smoke aperture and the door are then closed until the bread is done, by which time the heat has moderated sufficiently to permit easy handling of the fresh loaves. Except for special orders, the bread is made without any salt, and is generally well baked, there being small chance for either under or over baking. The depth of the ovens varies from two feet to two yards, the smaller ones being reserved for cakes, pastries and buns, which are baked in the daytime.

Cakes are invariably of the sponge-cake family, but pastries are fit for a king, while there are buns to suit every taste. A plain ring-shaped bun is called clambella,

ing to the quality desired. Much of the wheat used in Italy is imported, and there is a heavy duty upon it, as also upon sugar and other necessities of life. The military bread is hardest and blackest of all, and one often sees it carried through the streets piled high in nets of rope, and looking like so many rocks. It is made in the barracks by the soldiers themselves, but that they can make better bread I can testify from a fair trial of it some years ago. The Roman bakers went on strike, and almost before their customers knew of the threatened dearth, the municipal authorities had overhauled the large garrison and put a hundred professional bakers to work. They did the city baking for a week, and at the end of that time the regular bakers found it to their interest to resume operations, while the soldiers as quietly returned to military life.

Bread shops are as plentiful as barber shops, which Mark Twain says adorn every street in Italy, and are as liberally patronized by all classes. Although of course, as in other countries, the rich consume less in proportion, Italy may be called truly a nation of bread eaters, and the working classes have a peculiar fancy for sopping bread in a liquid. If not already stale, the bread is toasted and crumbled into coffee, soup, oil, wine—anything liquid.

The beggars go from place to place, stuffing their pockets with the hardest crusts, which they carry home to *insupp-are* in whatever they can afford—hot water seasoned with pepper and oil not being disdained. Servants will submit to limits in other food, but insist upon plenty of bread. Most of them care nothing for fruits or sweets, and are content with meats once a day, but it would seem exaggeration to state how many pounds of bread a female cook requires to crumble into her morning coffee, her noonday broth and supper salad made sloppy with vinegar and olive oil.

One source of wonder is the indifference of Italians to the careless handling of bread as it runs the gauntlet from forno to table. A well-appointed Roman kitchen

is an attractive sight with its rows of shining copper and cooking vessels, and the kitchen tables have marble tops that are kept scrupulously clean, but bread boards and boxes are not considered essential articles of kitchen furnishing. At the forno the bread is thrown loosely into a covered hand-cart, which is pushed from place to place by a boy whose business it is to leave the proper quantity at each house in his round. At the street door he tucks the loaves affectionately under his arm, and running up the steps rings the bell. If the housemaid be sweeping the hall, she dumps the bread on the nearest chair and calmly continues to raise further dust on her mistress' breakfast rolls. If, however, she fails to answer his ring promptly, the boy leaves the loaves to ornament the doorstep, and hurries off to finish his morning duties. One often sees a youth carrying a basket under his arm so that his wet or dirty coat sleeve rests on the upper rolls, and a woman's favorite way of slicing bread for the family meal is to hold the loaf firmly against the chest and cut towards her. It is not uncommon to see children carrying some bread for the next meal, and dropping it anywhere in order to inquire into the whys and wherefores of a street fight, or to indulge in a wayside game of castelline, the Italian boy's substitute for marbles.

Constant vigilance over a power plant will result in a great saving of expenses.



FLOUR MILL OF T. HULL, LAKEFIELD, ONT.

and there are others flavored with almonds and aniseed and which are in much demand with those who prefer quantity to quality. The maritozzo is a Lenten specialty of Rome, and is made with olive oil. The name means literally "a piece of Mary," and the mere mention of maritozzo will make an old Roman's mouth water when he is far from home, for strange to say this toothsome bun is not to be found in other Italian cities.

Some large bakeries make a practice of turning out "hot cross" buns every afternoon about 4 o'clock, and these are distributed by hundreds among small dealers, besides being sent in baskets to the public squares and street corners to catch the pennies of scores of school children, who return home about that hour. Many, however, are retailed hot from the oven for "one a penny, two a penny," and good customers may venture to inspect the open and fast cooling ovens, or peep into the huge flour bins. The head baker is generally on exhibition, powdery and picturesque in rather scanty attire of white linen. After dark, one may bask in the red glow from the night oven and catch glimpses of shadowy white figures sadly lacking in drapery; but out of regard for to-morrow's breakfast, it is best to penetrate no further into such mysteries, for popular voice will have it that those ghosts knead without hands, and are adepts in the treadmill business.

The qualities of bread are numerous, and the prices vary from 5 to 10 cents a kilogram—36 ounces—accord-

VIEWS AND INTERVIEWS.

Primitive
Flour-Milling.

In some districts of the Lower Rhine, we are told by the London, England, Miller, flour-milling appears to be in a very primitive condition. Custom mills abound, the toll on the grinding of 100 pounds of rye, barley, oats or maize being six to seven pounds. As the miller has to fetch the grist and to deliver the meal, which often means two journeys of many miles each, he cannot be said to be overpaid for his labor, especially if he uses a steam motor. But even for these modest gains he has to fight hard with the co-operative farmers' mills that are starting up on every side. In custom mills the wheat is ground just as it comes from the peasant's barn floor. No cleaning is attempted by the miller, nor is it usual with him to dress the meal, that operation being left to the sender of the grist. As a rule, mills of this description are destitute of the rudest bolting-chest. In this part of the world there are also said to be some large mills that are quite innocent of roller-milling, and yet produce fine white flour.

The Better
Way.

"A dram of prevention is worth many tons of cure," is especially true in the case of the miller who is maimed for life, wisely writes the American Miller. It is very poor policy to delay covering that big set screw which has caught your sleeve or pantaloons so often. It should be covered with one-half of a solid rubber ball or with sheet iron bent about shaft so that the end of the outside lap will follow and not precede the part which supports it. Exposed gears should be covered up before some one slips or by carelessness gets caught therein. Running belts should be encased, and kept so. Where danger lurks wire netting or a cover should be put up. A kindly disposed millowner frequently gives assistance to the family of an operative caught and killed in his man trap. He never thinks of the greater service he would have rendered that family by placing guards about the dangerous places, but immediately seeks a new miller to risk his life in the mill. The very careful miller is no more likely to escape the mill's death traps than the careless one, for the most cautious, wary and vigilant miller has spells when he is very careless.

A Jack-at-all-Trades
Miller.

The Jack-at-all-Trades is not usually thought much of, but a writer in the Milling World comes nobly to his defence in this fashion: "Those who ridicule the 'Jack-at-all-Trades' do not remember that the same talent that enables a man to do one thing well, is likely to enable him to do another or twenty other things quite as well. Because a man has skill in manipulating the cleaners of a mill, it is ridiculous to assume that he cannot do quite as well in manipulating the roller-mills and the purifiers. Yet that assumption is openly made by certain writers on mill subjects. Recently I visited a 200-barrel mill, in which I found a perfect specimen of the 'Jack-at-all-Trades,' and I have the owner's word for it that the man is master of all the work implied in the superintending and running of a mill. Says his employer: 'He can turn his hand to anything, from programming a mill down to mending a bolt-silk, and anything he has ever done has been done simply perfectly. He is worth ten times his wages to me. I go to him with everything that turns up, or breaks, or gets out of shape in any way. He is a whole mill-wrighting, mill-building, mill-furnishing and mill-maintaining establishment in one. When he leaves me, I'll quit the business.'"

The Practical
Engineer.

In an article in the Stationary Engineer, George Geisler argues that the man who learns to be a good engineer by actual practice in the engine room is more practical than one who has been a machinist. A good engineer, he says, will never stop an engine during working hours, unless he is absolutely forced to it on account of damage that might be done. Where a factory or other plant is in operation with a number of hands employed, a shut-down means a loss in time that cannot again be made up. Much is to be left to an engineer's judgment in case an accident occurs, or a defect is shown, and the engineer who has learned the business in the engine

room is much more likely to know what course to pursue than one whose training has been of an entirely different nature. In case of an accident a machinist will take the injured part out and repair it in the way he learned to do it in the shop, which, in most cases, will take considerable time; and the practice will differ from that of the real practical engineer, who will find some means of repairing the damage, or overcoming the difficulty, temporarily, or until such a time as the engine can be shut down and the work done in a thoroughly practical manner.

Water Pail
Fire Engine.

Let us despise not the day of small things, for in some of the affairs of life the good old ways are even yet the best. The utility of the water pail as a fire extinguisher is a case in point. "With all the refinements that have been made in fire extinguishing apparatus," says a writer in Cassier's Magazine, "the fact remains that the simple pail of water is, even to this day, one of the most efficient pieces of apparatus of this class that has yet been in use. Insurance statistics indeed show that more fires are put out by water pails than by all the other appliances put together, the only point that can well be raised against them being that, while they are generally provided abundantly enough in places where they are likely to be of service, the water is very apt to be wanting. It is true also, in a measure, that, even if the pails were kept full, they are often borrowed for some purpose and not returned, so that when most needed they were unavailable. As a way out of this difficulty, it has been proposed to use pails with round or conical bottoms, which will not stand on a floor, and are not, therefore, likely to be taken off for some use for which they were not intended, but this form seriously diminishes the value of the pail as a fire extinguisher, since a man with two of them in his hands, arriving at the scene of action, cannot use either without setting the other on the floor and losing all its contents. As an improvement on this, a superintendent in one of the large New England mills, who had found it difficult to keep the fire pails full and in good order, some time ago adopted the following interesting expedient, of which we find an account in some scrapbook data: The hooks carrying the pails were fitted up with pieces of spring steel strong enough to lift the pail when nearly empty, but not sufficiently so to lift a full pail. Just over each spring, in such a way as to be out of the way of the handle of the pail, was set a metal point connected with a wire from an open-circuit battery. So long as the pails were full, their weight, when hung on their nooks, kept the springs down, but as soon as one was removed or lost a considerable portion of its contents by evaporation, the spring on its hook would rise, coming in contact with the metal point, thus closing the battery circuit and ringing a bell in the manager's office, at the same time showing on an annunciator where the trouble was. As the bell continued to ring until the weight of the delinquent pail was restored, it was impossible to disregard the summons, and no more reason was found to complain of the condition of the fire buckets."

BROAD BELTING.

WHEN a great power is to be transmitted and broad belts are required, cotton belts may be used with best success, says the Textil-Zeitung. In such cases they are preferable even to the best leather belts, because they are not only cheaper, stronger and more durable than the latter, but they also run much more steadily and uniformly. They also stretch less. The explanation is readily afforded. The leather belts must be cut from tanned hides. Hides are invariably thickest upon the back and thinner on the sides and flanks. From this fact arises the great difficulty of making a leather belt equally strong throughout its entire breadth. The broader it is the more insurmountable the difficulty. The greater, however, the power to be transmitted, the broader the belt must be. When, therefore, very broad leather belts are to be used, they will show defects in running that cannot be corrected in any manner. Unsteady running, stretching and lashing are some of the defects which may be mentioned. The cotton belt behaves much better. When well woven, its strength is unlimited, it may be made of any breadth and it is able

to resist a much greater strain than the best leather belt. At the same time it is perfectly uniform in material and thickness throughout its length and breadth and, consequently, entirely free from the objections urged to the leather belt. Its price is also much less. While the cost of increasing its breadth depends upon the increased quantity of raw material and labor, the price of the leather belt increases in much greater ratio with its augmented breadth.

THE FOOD QUESTION.

BY DR. EMMET DENSMORE.

WHENEVER bread is the only food man is able to procure, it is important, as the Grahamites claim, that such bread be made of the entire wheat, and that none of the dark-colored gluten be separated from the flour. It is undeniable that the very poor classes, such as abound in the east end of London, and whose nourishment is made up very largely from bread alone, would be considerably benefited if they could be induced to use whole meal-bread instead of that made from white flour, which has been robbed of a considerable portion of its gluten, and for this reason does not afford the needed amount of nitrogen.

It is only among the intelligent and well-to-do classes that entire-wheat bread has found favor; and this bread has been and is a damage to this class. The well-to-do the world over habitually use a considerable portion of milk, eggs, cheese, fish, flesh and fowl. These foods furnish an ample supply of nitrogen in a form much more easily digested than the gluten of wheat; and these foods have the additional advantage of being rich in oil, a necessary element in man's dietary, and one he has insisted upon having throughout the ages. To those who are provided with flesh and animal products, in quantities to supply the needed nitrogen, bread made of fine flour is preferable because it is much more easily digested than that having a large portion of gluten. I have elsewhere shown that all but one or two per cent. of starch foods is digested in the intestines. A person provided with an ample supply of nitrogen and oil in animal products does not require the nitrogen of the gluten, which is much more difficult of digestion; and if fine flour—white bread—is eaten with such animal products the needed nitrogen is readily obtained from the animal products, and the starch foods soon pass on to the intestines to undergo transformation into a glucose; whereas, if the entire wheat bread has been eaten, there is necessarily a considerable effort on the part of the system to separate and digest the extra amount of gluten, the need for which has already been anticipated by the animal products. This necessity on the part of the system to separate and digest an element which is not needed and not used is a very considerable strain upon the nervous system.

A glance at the history of nations will supply proofs of this connection. The Chinese, Japanese, and the millions in India who subsist chiefly on vegetable foods are smaller in stature, shorter lived, are weak relatively, both mentally and physically, and have accomplished far less of the world's work than the English and German nations, who have been liberally supplied with a flesh dietary, and (so far as England is concerned at all events) whose bread has been chiefly made of ordinary fine white flour. Another proof that bread and starch foods are a great strain upon the digestive powers is found in the phenomenal benefits accruing to invalids by the use of the Salisbury diet, which consists exclusively of beef or mutton and water. When these patients recover their usual health they generally return to a diet of bread and starch foods, and frequently relapse again into invalidism, to be again cured by again adopting an exclusively meat diet. The increasing favor with which a milk diet for invalids is being received by physicians of all schools is another strong evidence of a non-starch diet. The German Spas and continental health resorts are filled each year by tens of thousands of patients from the effete and luxurious idle class in Europe, to "undergo" a yearly "cure." These establishments insist upon a greatly diminished amount of bread, no potatoes, and a corresponding increase of meat, eggs and milk.

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LINING UP AN ENGINE.

By W. E. CRANE.

ENGINEERS are often bothered by the pounding of their engines, and as pounding can be heard by everyone in the neighborhood, it is very annoying. There are many things that cause pounding, so that in some engines the cure of it is quite a complex subject. Being out of line is the general cause. Either the shaft is not in line with the cylinder, or the crank pin is not put in straight, or something else of the kind is the matter. A high speed engine perfectly in line will be very

the cylinder around and put in strips of brass at L, Fig. 1, as this is the place that the guides are usually out. This is quite a job and requires some time and considerable patience. It is occasionally necessary to shim the cylinder up on the other side. The line will now have to be set over again, until it is once more straight with the cylinder and guides. Fig. 7 is a cross section of the guides through the line XX, Fig. 6. A plumb line suspended from point P will tell if the guides are perpendicular. If not, the bed should be swung over, or around, until they are. In case this cannot be done, either the cross-head will have to be changed in the shoes, or the shoes themselves changed so as to run straight in the guides, and at the same time bring the cross-head pin level. Knowing the style

of cross-head it would be easy to tell how to do this. It is a very good test for an engineer's judgment.

The next thing to consider is the crank. Cut a small stick that will just fit into the crank, and mark a line across the center. Bring the crank pin up under the line till it touches, and note whether the line crosses the mark on the stick, or how much of it is out; and then turn the crank around and bring the pin up under the line on the other side. Note how much it is out on that side, and if out, whether it is on the same side of the mark as before, or on the opposite. If on the same side, it shows that the center of the pin is not in line with the cylinder, and the shaft must be shoved endwise until the line crosses it at the middle.

If the construction of the engine will not allow this with the means at hand, take off from the side of the crank-pin boxes the amount that the line shows that it is out. Then fit pieces of brass on the other side of the crank-pin boxes to make up what has been taken off. If the boxes can be recessed for these pieces, all the better; but if not, they can be fastened in with pins. If the line is on one side of the mark when the crank is on the center, and on the other side when on the other center, it shows that the shaft is not square with the cylinder, in which case the outer end of the shaft should be swung around to bring it straight with the line. If it should happen that the shaft could not be moved at that time, the distance that it must be moved can be calculated, and then it can be done any time afterwards.

Suppose that Fig. 8 is a shaft and crank. It is plain that as the distance from the angle to 1, in either direction, is the same, moving one of these points a certain distance will move the other one the same distance; but if we double the distance to one of them, carrying us to 2, then we should move 2 twice the distance that we should 1; so that to find the distance we should move the end of the shaft we must divide the length of the shaft up to the outer pillar block by the length of the crank (not the length of the stroke), and multiply the result by the distance that the line is out from the mark on the pin. For instance, if the mark on the pin is out 1-16, the shaft $2\frac{1}{2}$ feet long, and the crank one foot long, we multiply the 1-16 by $2\frac{1}{2}$, which makes 5-32 that the outside pillow must be moved. To find if the shaft is level, place the crank upright and suspend the plumb line down over the end of the pin, and then turn the crank down and note how much it is out. A similar calculation will give the amount the end of the shaft must be raised or lowered.

To determine if the crank pin is straight with the shaft would be an easy matter if the face of the crank was flat; but as a general thing, when the shaft is finished it is left uneven, as can be seen by putting on a steel straight edge. Even if the face is flat it is possible that it is not square with the shaft. To determine, then, if the pin and shaft are parallel, take two thin blocks C C, Fig. 2, and a straight edge D, and hold them in position by the stick E placed against any

handy support. The blocks C C should be placed against the end of the shaft the same distance from the center. The straight-edge D will then be at right angles to the shaft, and a square placed against the face of it and against the pin will show if the pin is straight one way. To determine if it is straight the other way, place the blocks C C and the straight-edge D in a horizontal position, suspend two plumb lines, F F, over the pin, as shown in Fig. 3, and run the square H along the straight-edge to the lines, when it should touch both lines. Should the pin become loose in the hole, and it be necessary to bore out the hole before putting in another pin, the boring can be set in the same way.

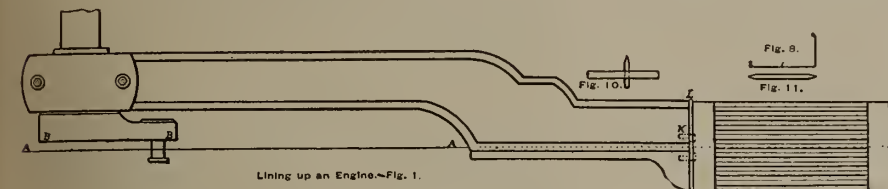
It should be remembered that a crank-pin wears only on one side, and also that, if it has been out of line, one end may be worn more than the other. This can be ascertained by calipering, and if the pin is not straight the difference must be allowed for, according to the circumstances of the case in hand. When the brasses have been babbitted, there will be a small ring on each end of the pin that will not be worn. Pounding is sometimes caused by the piston running over the ports, as shown in Fig. 9. The piston may then be thrown to one side, or raised up from the bottom, even when the steam enters the top. When such is the case, nothing can be done except to make the piston fit the cylinder as well as possible. Fig. 11 is a caliper stick for setting the line, and can be whittled out of any handy piece of pine.

SPLIT PULLEYS.

HAS it ever occurred to you, says J. A. Allen in the Iron Trade Review, that there are some methods coming into vogue that are cheaper in the long run to use than to be without? Among these is the split pulley. It costs money, and big money, too, at times to cut a keyway in a shaft when a new pulley is to be located. Have you ever used a good split pulley? If not, do so. A short time since I fitted out a whole shop with pulleys and shafting, and used nothing but split wooden pulleys. Hold? Well, not at first. Each pulley was tightened as well as we could do the work at the start and then watched. At the first indication of a slip the wrench was put on again and that settled the matter for all time. I had those pulleys driving every conceivable kind of ironworking tool, from a light drill to a heavy hammer, and never had the slightest indication of trouble. Then, when new tools were bought and old ones had to be shifted, ten minutes sufficed to take down the pulley. But when I did that job, I didn't know as much as I do now. I allowed builders to sell me tight and loose pulleys on the counter-shafting, so that for every machine having a four-inch belt I had to buy a nine-inch split pulley. If I had the job to do again I would specify clutches. Of course the clutch would cost more than the extra paid for the double width split, and the additional loose pulley, but not so very much. And then I would save weight on my main line; and room also.

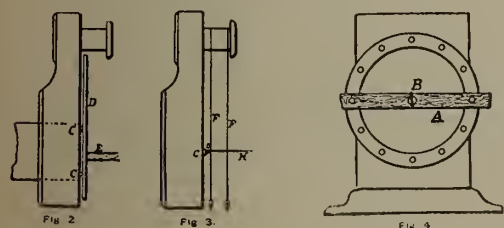
WHEAT FOR FORTY-EIGHT YEARS.

	Lowest price per bu.	Highest price per bu.		Lowest price per bu.	Highest price per bu.
1846.	\$0.68	\$1.27	1870.	\$1.14	\$1.80
1847.	1.05	2.90	1871.	1.20	2.00
1848. ....	.97	1.40	1872.	1.50	2.15
1849. ....	.97	1.10	1873.	1.55	2.25
1850. ....	.95	1.18	1874.	1.18	1.95
1851. ....	.68	1.04	1875.	1.24	1.60
1852. ....	.84	1.15	1876.	1.17	1.60
1853.	1.00	1.66	1877.	1.35	2.20
1854.	1.37	2.13	1878.	1.00	1.50
1855.	1.67	2.70	1879.	1.05	1.63
1856.	1.25	1.65	1880.	1.07	1.55
1857.	1.10	1.85	1881.	1.20	1.63
1858.	1.00	1.33	1882.	1.10	1.66
1859.	1.12	1.65	1883.	1.10	1.57
1860.	1.12	1.48	1884. ....	.77½	1.10
1861.	1.08	1.38	1885. ....	.83	1.01
1862.	1.10	1.60	1886. ....	.79½	.93
1863.	1.20	1.95	1887. ....	.76	.97½
1864.	2.40	3.20	1888. ....	.83¾	1.17
1865.	1.45	2.65	1889. ....	.78	.95¾
1866.	1.90	3.35	1890. ....	.79	1.04½
1867.	2.00	3.55	1891. ....	.92¾	1.22¾
1868.	1.50	3.25	1892. ....	.70¾	1.04½
1869.	1.20	2.30	1893. ....	.65½	.82¾



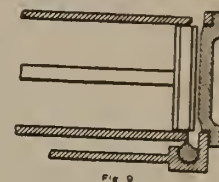
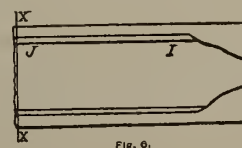
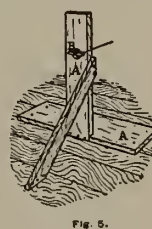
apt to pound with a light load, unless there is considerable depression, owing to the heaviest thrust coming on the end instead of the commencement of the stroke. The thrust is caused by the momentum of the moving parts. To ascertain if an engine is in line, the back cylinder head should be taken off, the piston, piston rod, and cross-head should be taken out of the way, and a line A A, Fig. 1, should be put through the cylinder and extended beyond the crank. To hold this line in the cylinder we take a strip of board, A, Fig. 4, and bore a couple of holes to fit over two of the studs at the end of the cylinder, and in the center of the board we bore a larger hole, say $1\frac{1}{2}$ or $1\frac{1}{4}$ inches in diameter, and attach the cord to a little stick B, that stretches across the hole. The strain on the cord will hold this in position, and it can be readily shifted.

In front of the crank set up an upright, A A, Fig. 5, with a hole in it and a stick B across it. The hole should be in line with the middle of the crank pin. The cord used for this purpose should be strong and small, and should be made of something that will stretch perfectly straight. A silk hair line, such as is used by fishermen for fly fishing, is the best. Some men use annealed wire, but wire gets hard and stiff, and kinks get in it which can never be perfectly straightened, and one of these kinks is very apt to come where you want a perfectly straight line. Wire is not recommended. Be sure that the stuffing box K, Fig. 1, is perfectly clean. Attach one end of the cord to the stick B, Fig. 4, and the other end to the other stick. The cord should then be drawn so tight as to be perfectly straight. It can be tightened by turning the stick B over and over. To center the string cut a stick a trifle over one-half the



diameter of the cylinder in length, and try the cord in the end of the cylinder, cutting off the caliper stick as occasion requires, until the cord is exactly in the center of the cylinder. Then get a shorter stick and try in the stuffing box, moving the end of the cord that is beyond the crank until the cord is centered in the stuffing box. Then go to the back end of the cylinder and try that again, and so on from one to the other until the line is exactly in the center in both ends of the cylinder. There is now a line to work from to bring everything straight with the cylinder.

The first thing is to find out if the guides are in line. Take a stick (Fig. 10) with one side straight. Bore a small hole in it and put in a second stick, as shown in the cut, so that it will be held snugly but will still be loose enough to be easily moved. Set this stick against the edge of the guides at I and J, Fig. 6, and move the small stick up to just touch the line. The end of this stick should be sharpened so as to bring a small surface to the line. If the guides are in line, the stick should just touch the line when tried at both ends. If they are not in line it will touch the line at only one end. If that is the case there is but one remedy, and that is to swing





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The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

WHY BRITISH FLOUR TRADE IS SLOW.

IN a letter from Mr. David Plewes, an old Canadian miller, but for some years engaged in the trade at Liverpool, Eng., various reasons are advanced for the present depressed condition of the British flour market. The letter is of particular interest to Canadian millers, because of Mr. Plewes' old-time experience in the business here, and also for the reason that his operations in Great Britain have been altogether with Canadian flours. The letter will be found on another page of the MILLER.

We shall not retrace the references by Mr. Plewes to the general financial conditions, common to trade on both sides of the Atlantic, that have affected the flour market as they have affected commerce generally. Nor is it necessary to discuss, which is fully done in the letter in question, the changed conditions in Argentina and India, that have had a very direct bearing on the depression of flour in the United Kingdom.

There is one point, however, touched by Mr. Plewes, that whilst not left without consideration by Canadian millers, will bear repetition and renewed emphasis. Our reference is to the improved condition of British milling to-day, as compared with what it was not many years since. It is just as well to recognize the fact, that has been plainly stated in these columns more than once, that British millers are as well able to turn out first class flour to-day as are any of the mills in this country, or our neighbors to the south of us. To borrow Mr. Plewes own words: "No country in the world has better flour mills than Great Britain, especially England and Scotland." At the annual meeting of the Winter Wheat Millers' League of the United States, held within the past month, this matter was dwelt upon at some length in a special paper read before the association. To quote for a moment from this paper, the author says: "For a long time we felicitated ourselves in the belief that the American miller was ahead of all the rest of creation in the work he was doing. It is only necessary, in order to be disabused of this idea, for us to now go into one of the well-equipped mills in England or Scotland, and observe the substantial, modern machinery, and note the painstaking care in operating the same, to recognize that the British miller is up to date in his ideas and practice." And the conclusion arrived at by the American miller is much the same as that of Mr. Plewes, namely, that the only point in which we now have the advantage is in being able to obtain our wheat from first hands, free from admixture or adulteration. Unfortunately, in Canada we are losing the strength of

this advantage in the unfair difference between the freight rates of flour and wheat, when exported to Great Britain. What Mr. Plewes says on this point is very plain and clear, and ought to serve as a powerful lever with Canadian millers in their present fight against the railways.

OUR TRADE WITH THE INDIES.

CORRESPONDENCE, that we publish on another page, relative to flour trade with the West Indies, ought to call for serious thought from Canadian millers generally, and certainly from those who are aiming to develop an export trade in flour. It is quite unnecessary to point out here, for we have never been negligent in this respect, how necessary to the success of flour milling in Canada, is a prosperous export trade. With the number and capacity of Canadian flour mills, we are obliged to seek other than a local market for the output of these mills.

What we want to feel sure of when a market opens out, is that no effort be spared by millers to cater in the most perfect manner to the requirements of that market. The correspondence to which we have made reference would indicate that the trade had been somewhat lacking in this respect. There had been difficulty at one time in shipments to the West Indies because of the nature of the packages in which the flour was sent. But so soon as attention was drawn to the matter the remedy was promptly applied. The letter, and analysis of the government analyst of Demerara which accompanies it, tells distinctly that Canadian flour is not at the top among flours that are exported to that country. It may be said that we stand two in the procession, but why do we not stand number one? The result of Commissioner Adam Brown's investigations and experiments in Jamaica, at the time of the exposition there, showed that Canada had the flour that was specially adapted to that country. The fault may be that we are not following as closely as we might, the advice given by Mr. Brown at the time, to make sure that proper flours are sent to the Indies.

If our wheat is at fault, or if it is the case that certain wheats must be used to make such flour as is required in the Indies, whilst other wheats, though good, will not answer the purpose, we would like to have this information. And yet one can hardly suppose that any blame is attachable to the quality of wheat used. Does not Canada grow the best milling wheat in the world? Elsewhere we remark that a deputation of English millers is about to visit Canada to study our methods of cultivation of wheat and arrange for a direct supply of Manitoba wheats for milling purposes. Is our milling at fault? Can it be that Canadian millers are dropping behind in the art of fine milling? Some one or something is to blame. There is fault somewhere. Will our readers say where?

DEEPEN THE CANALS.

NO apology is needed for referring again to the question of deepening our canals. The attention that is being given to the question by press, and people, in all parts of the Dominion, shows the importance that is attached everywhere to this transportation problem.

A Buffalo paper is urging the deepening of the Erie canal, and takes the ground that New York state must stand by this carrying route. Somewhat narrowly, commenting on the agitation here to deepen the Welland and St. Lawrence canals, this Bison City journal says it can see no advantage in the step to this country, "so long as Canada could do nothing further than to sit down and see the ships go by." The Star generously replies to this criticism by saying, that in Canada we are able to take a broader view of the question. This country has the natural waterway outlet for large quantities of products, both of Canada and the States; and any plan that will develop and strengthen the carrying facilities alike of these two countries, is going to prove a gain to commerce as a whole, by which Canada individually will be benefitted, and may be proud in having helped.

The direct help that will accrue to the development of Manitoba and the Northwest, in the handling of its large wheat output, by the solving of this transportation

problem, has already been made clear in a late issue of this journal.

The question of expense seems to be the great bug-bear. The project, however, is not unlikely to take some practical shape, as already a committee of business men is commencing to move in the direction of securing the deepening of the canals to permit at least ocean vessels coming to Toronto, and also the building of a railway to connect Toronto with Hudson Bay.

We shall be glad to find our readers taking an active interest in the discussion, and any expression of opinion received will be given space in these columns. It is a timely question for all interested in the shipping of wheat and flour.

EDITORIAL NOTES.

IT is a compliment to the fine quality of Manitoba wheat that a committee of British millers is to visit Canada this summer for the purpose of studying methods of cultivation of wheat by our farmers, and to endeavor to arrange for a regular and direct supply of Manitoba wheat for milling purposes. Information of this visit has been communicated to the Hon. Mr. Bowell, Minister of Trade and Commerce. This is just another circumstance that draws attention to the necessity of improving our water-ways. If Manitoba is to export wheat in large quantities to Britain, New York ought not to be the line of connection.

IN former agitations for the building of the Huron-ontario ship railway, illustration has always been made of the Chignecto ship railway, extending from the Gulf of St. Lawrence to the Bay of Fundy, as evidence that this method of carrying is quite practicable. Not because of its impracticability, however, but for the reason that there does not appear to be a sufficient volume of traffic to keep the line busy for a large portion of the year, it is understood that at the annual meeting of the Chignecto ship railway, which is to be held in London, Eng., this month, the report will be of a decidedly unfavorable character, and will probably have some bearing on the continuance of the railway.

ACCORDING to statements that have reached us from the Maritime provinces, trade there in Ontario flours, especially in Nova Scotia, is being facilitated considerably through the agency of the "Seely Packet Line," running in conjunction with the great railways. The Sun, of St. John, N. B., says that from inquiries made it learns that this trade is steadily growing in volume. Shipments of flour have been delivered from Ontario via C. P. R. and Carleton, to Canning, N. S. in 7 days. The time via Boston is 3 to 6 weeks. The Sun tells of a Nova Scotia merchant who says he had a car of flour from Boston delayed over 5 weeks. The advantages of this method of shipping are worth careful enquiry by Canadian millers. With so decided an advantage in time, as contrasted with Boston shipments, trade from there ought to show a marked development.

AN interview of the grain men of the Northwest with President Van Horne, of the Canadian Pacific Railway, at the time of his recent visit to Winnipeg, has not been productive of any important relief on the score of freight rates. Mr. Van Horne stated quite distinctly that the cost of carrying the grain over the road at present rates would not permit of any further decrease. The request made to the railway was to make a reduction to 12c per 100 lbs. on wheat and other grains from Winnipeg to Lake Superior points, with a proportionate reduction from points west of Winnipeg. The present rate from Winnipeg to Lake Superior is 17c per 100 lbs. for grain and mill stuffs, as against 21c a year ago. The transportation question, viewed from several standpoints, is a live one with our friends in Manitoba. Mr. Van Horne has stated that he will take into consideration the question of a reduction in elevator rates.

A German officer has invented a motor in which a fine stream of coal dust is utilized to drive a piston by explosion in the same manner as the gas in the gas engine.



RUNNING across one of the best informed members of the milling trade the other day, I incidentally mentioned to him the criticism that has been passed on Canadian flours going to the West Indies, as per certain correspondence through Mr. N. Weatherston. He had been shown the correspondence. I asked him, what was the matter that Canadian millers had fallen so far short of meeting West India requirements? "I am just interested enough," he said, "in the outcome of trade with the Indies, having given considerable thought and study to it, to be quite anxious to see how Ontario millers will explain this matter." Informing him that Mr. Weatherston had handed the correspondence to the CANADIAN MILLER for publication, he said, "I am real glad of it, and hope the result will be that our millers will rise and explain. An explanation is certainly required."

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One of the discouraging signs of the times at present is the shrinkage in shipments from Canadian ports to Great Britain. Talking a few days ago with a gentleman who had just come up from Montreal, I asked the question, if there was any marked activity in shipping matters there, and his reply was that everything appeared to be dull. Glancing through the columns of a Montreal newspaper, I notice that a similar statement is made, putting the case as strong as to say that the freight market is demoralized and ship agents have found the greatest difficulty in filling their tonnage. So far as grain is concerned freight rates are only nominal.

* * * *

Mr. S. A. McGaw, manager of the Lake of the Woods Milling Company, and president of the Winnipeg Grain and Produce Exchange, when in Montreal a few days ago, said to an interviewer: "With the exception of the Red River valley and 75 miles west of the main line of Winnipeg the crops will be in ten days or two weeks earlier than last year. The reports are that the crops are looking very well, and there has just been a little complaint about the dry weather." "About the farmers?" "Well," Mr. McGaw said, "the very low price of wheat is making the farmers think of trying the experiment of mixed farming, and in the southwestern part of Manitoba, with good results." "What are the immigration prospects?" he was asked. "There has been considerable immigration from Dakota and Minnesota, whole families moving to Alberta, and I think there would be a good deal more if they had money enough to get out. Among those immigrating are many Canadians returning to their own country." "No, I have not heard any complaints from immigrants who settled in the Northwest last year; they all appear to be well satisfied with their new homes."

* * * *

"Some decided changes have taken place in the flour trade," remarked a prominent officer of the Dominion Millers' Association, the other day. "And do you know," he continued, "I noticed the change in the packages about as much as anything else. A few years ago it was almost impossible to ship flour in anything but barrels. Flour sent to the Maritime Provinces often had to travel up and down the coast in small open sailing vessels, and nothing but barrels would protect it from rain and rough weather. But when the merchants of Lower Provinces began to buy Manitoba flour they had to put up with sacks. For, with the exception of the flour made by the Lake of the Woods Milling Co., the Manitoba product is put up entirely in sacks. An increased use of railway facilities had also rendered any extreme protection from the weather unnecessary. It is the same with the trade to the lumber camps. Formerly flour sent there had to be packed in barrels, but now they, too, are taking sacks. So it may be said that the only trade at present demanding barrels, is that with

the West Indies. And here our barrels are not, from all accounts, giving satisfaction."

* * * *

"If silver continues to fall there is no reason why wheat should not cheapen indefinitely?" said Henry Chaplin, in an address before a convention of Scottish Chambers of Husbandry. Mr. Chaplin was President of the Board of Agriculture in Lord Salisbury's ministry. "We propose as a remedy," he continued, "an international agreement to revert to the system which prevailed prior to 1873. The fall of wheat from 1873 to 1895 was 40 per cent. The British commissioners studied the price of wheat in America in 1879, and believed it could never be exported cheaper than forty shillings per quarter. But superior Indian wheat was sold last week in Hull for 19s 3d per quarter. Most farmers believe the fall in prices is due to foreign competition, and that the remedy is protection. But half the countries of the continent and the United States, while imposing the heaviest duties upon imported produce, complain of agricultural depression. American farmers are becoming bankrupt even faster than the British farmers. Others contend that over-production is responsible for the fall in prices, but statistics show that the production of wheat has decreased, although the prices have fallen. The real cause was the demoralization of silver in 1873, and the subsequent divergence of the relative values of metals, which enabled silver-using countries like India to export wheat at the present low price."

* * * *

"Among other matters that will, no doubt, be discussed at the meeting of the executive of the Dominion Millers' Association on the 12th inst.," said Mr. C. B. Watts, in talking with him the other day, "will be the time and programme for the coming annual meeting." Different views prevail as to what is the best time to hold the meeting, and also the programme to be carried out. Usually the meeting has been held early in August. "But some are of the opinion," said Mr. Watts, "that September, say the first week of exhibition, would be a better date. Then there is the plan as to the nature of the social gathering at the close of the business of the convention. Last year, as you will remember, we took a trip to the Falls, and it was certainly a delightful trip in every way. Can we repeat this, or take a similar step with the same success, this year? It has been suggested that we go by the American side this year, and lunch there, for a change. On the other hand, it is thought that to have a banquet follow the annual meeting in September, would be a good move for various reasons." "You see," continued Mr. Watts, "it has to be remembered that money is scarce this year, and in any programme mapped out this factor needs to be considered." With somewhat of a faint heart, I asked the secretary, if the flour trade continued just as dull as ever? He replied: "There is really no cessation to the dullness. Only ten days ago I received a letter from a flour merchant in the Lower Province, a shrewd and well-posted member of the trade, and his advice is in these words: 'Millers should all close down or make only for what orders they get, and make no more.' American millers are cutting terribly into price, and as a result are commanding the larger part of the Newfoundland trade. In the opinion of this Lower Province flour handler, wheat will have to drop to about 50c. before there will be any encouragement to do trade; or else flour is to go up, which does not seem very likely. The position is no better in the English markets. This must also be remembered, that within a few weeks offal will be down equal to 3c. per bushel on wheat. All this seems very doleful, and yet it is the one story that I meet as I rub against millers everywhere. They are all hoping for the turn of the lane, but it is not yet in sight."

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W. E. Redway discussing the question of transportation, which he views as the question of the hour, asks: Where is the man who will establish a whaleback line for the purpose of carrying Ontario flour east and bringing back Maritime Province coal for return cargo? Taking into consideration the fact that the deepening of the last two sections of the lower canals is now under construction, and that it is expected (!?) they will be completed within two, or at the latest, three years at the outside, it will not pay to build whalebacks to fit the ex-

isting condition of the canals, costing over \$70,000 each, when they would become obsolete in such a short time. What appears to me to be the wisest policy is for every member of the Dominion Parliament from Ontario and the Northwest Territories, and every newspaper irrespective of party politics, to unite in a determination to have the lower canals completed to 14 feet, the locks to be made to the full Welland canal size, and all necessary approaches dredged without any delay, the work to be carried on night and day. Nothing should be allowed to obstruct the most vigorous policy possible in this direction, so that within two years, or one if possible, Canadian steamers, whalebacks and others within the dimensions of 260 feet long, 43 feet beam, and 14 feet shaft, carrying 66,000 bushels each, and returning with 2,000 tons of soft coal, should be able to proceed to and from the head of Lake Superior to salt water without transshipment of cargo. On arrival at Montreal or Quebec, whichever may be chosen as a terminus of the route, the 14 feet draught steamers could each in a few hours transfer its cargo to an ocean whaleback of 20 to 24 feet draught, large enough to contain the output of two, three or four of the inland water boats, or to suitable elevators erected for the same purpose, whichever may be found to be most practicable, and thus the great transportation question (of grain especially) would be put upon a solid and paying foundation. The moment this undertaking is completed Canada can control the situation as regards handling the products of the United States and our own Northwest territories. The deepening of the canals to 20 feet, so ably championed by our Toronto members, can for all practical business purposes for the immediate present be left to the treatment of a wise and progressive statesmanship, and whether the solution of the problem shall eventually partake of an Imperial or international character, or whether it shall become a question for the Dominion alone, it is nevertheless one of secondary importance to the commercial interests of to-day.

* * * *

A week ago I had the opportunity of meeting Mr. N. Weatherston, the energetic and genial manager here, of the Intercolonial railway. Mr. Weatherston tells me that there has been considerable shipments of flour during the past year to the West Indies, though from correspondence, which he placed in the MILLER'S hands, and which appears on another page, it would look as though millers were not doing everything in their power to develop this trade. I am in hopes that our milling friends will read carefully what is said elsewhere on this question and put themselves in position to compete with foreign brands wherever they may come from. It was encouraging to learn from Mr. Weatherston, and he kindly showed me correspondence on the subject, that a start has been made in shipping flour to South America, and that some 1500 or 2000 barrels have gone forward to Hayti. A letter that I saw in regard to this trade would indicate that there is a fair field there for Canadian flours, providing, however, that millers lay themselves out for the needs of that trade. Among the West India shippers are D. Goldie, Ayr; James Goldie, Guelph; J. & P. R. Howard, Hagersville; The Ogilvie Co., Seaforth; J. Martyn & Co., Alvington; Todd Milling Co., Galt; H. A. Mulhern, Peterboro; Robt. Noble, Norval; Rathbun Co., Deseronto; Sadler, Flavelle & Dundas Co., Lindsay; N. H. Stevens, Chatham; E. D. Tillson, Tilsonburg; R. A. Thompson, London; and J. A. Williams, Zurich. These shipments go along the G. T. R. or the C. P. R. as the case may be, on to the I. C. R. to Halifax, and thence by the steamships of the Pickford & Black Line. As with the ramifications of trade at any time the extension of an export flour trade in this manner means direct business to the millers shipping to these points; the market, already glutted, is relieved to that extent and increased business is brought to our railways and steamship companies. We ought all to be able to enthuse on the matter.

Floods caused by the recent heavy rainfall carried away the dam and sluices of Mr. Narcisse Garipey's flour mill at Baie St. Paul, Que. The ground on which his buildings stand was also greatly damaged by the torrent. The dam of Messrs. Boivin & Glasgow's flour mill was also greatly damaged.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

THERE is every indication that business is now opening up in the cooperage stock line, as although shipments of flour barrel stock are still not very large in Ontario, still, a great many enquiries are being received by manufacturers, and some very fair lines are being placed.

The following are the present quotations for cooperage stock, f. o. b. cars Toronto, in carload lots, for stock made at first-class mills.

	Per net 1,000
No. 1, 30" jointed elm flour barrel staves.....	\$5 85
M. R., 30" " " " " " "	\$5 50
No. 2, 30" " " " " " "	\$3 85
Special M. R. apple barrel stock.....	\$4 90
No. 1, 24" jointed elm staves.....	\$4 65
No. 1, 5½ ft. patent coiled elm hoops.....	\$6 05
No. 1, 6½ ft. " " " " " "	\$6 65
	Per set
No. 1 17½" kiln dried basswood heading.....	4¼c.
M. R., 17½" " " " " " " "	4c.
No. 2, 17½" " " " " " " "	3½c.
No. 1, 14" half barrel heading.....	3¾c.
Flat raked ash hoops, 6½ ft. long. (per net 1,000).....	\$3 25

	Per net 1,000
No. 1, 30" jointed elm staves	\$5 .00
M. R., 30" " " "	\$4 65
No. 2, 30" " " "	\$3 .00
No. 1, 24" " " "	\$4 .00
	Per set.
No. 1, 17½" kiln dried bass wood heading	4c.
M. R., 17½" " " " "	3½c.
No. 2, 17½" " " " "	3c.
No. 1, 14" half barrel heading	3½c.

The one-stave barrel, which has had so many ups and downs of late years, is said to be a success when the veneer "stave" is made of cottonwood.

About the Chicago market no improvement takes place. Tierces are slow of sale at 92½c., and barrels are quiet at 72½ @ 75c. Continued light receipts of hogs are the cause of the depression. Tierce hoops are scarce, and, in consequence, there is a trifle better demand, but prices are no higher. Staves are easy at quotations. Pork staves are not in heavy supply, but there is not much inquiry. There is no improvement in the demand for flour barrel stock, and prices are only nominal.

“A stave to be standard must be, when shrunk or dry, not less than three-fourths of an inch in thickness on the heart edge, and not less than four inches wide, besides sap ; the sap, narrow or wide, is never measured as of any value, although sound sap is always used in oil barrels — or any barrel that is glued before filling. These particular staves we are describing are always called oil barrel staves ; most of them, however, are used of late years for other purposes. For instance, a party for whom the staves are made owns a large cooper shop and makes all kinds of work. The country stave maker,

"Now our staves are run to a water course that is navigable for barges." The boom is gradually opened and the staves and heading are caught and loaded into the barges. They present an unsightly appearance, but this is no disadvantage compared with the cheap transportation afforded by the high water when everything works well; it seldom fails to be a success with good

management and a good industrious man to push the work, 5 per cent. often covering the loss by strangling timber, adverse currents and sinking in the mud. Staves costing about \$8.50 to \$9 per 1,000 are, when loaded in the barges, worth double that amount, and, in fact, the best of them three-fold the actual cost; but there are sometimes such difficulties as breaking of the booms, and then troubles begin in earnest. Great run-outs are sometimes so protracted, on account of the wonderful amount of rainfall, that booms break, letting several lots of staves out into the main river, some staves marked some not marked; some are caught, but it is a great harvest for the river pirates (men who watch along the shore with skiffs and haul the staves ashore, hundreds in a drift, at one stroke.)

"Parties interested follow the staves with boats and catch them in the hands of men who demand the lion's share, for salvage; some of them take the chances of prosecution for criminal offence and ship them by the first rapid transit to market. Such staves have been followed into the yards, where they were found being worked up at lightning speed, as they are always bought cheap. Some parties who buy drifted staves haul them to their yards, cut the branded end off, and in a few hours have the staves bucked and all chances of identity obliterated. We have known men who brought staves and run them in as a business, to buy a few branded staves in a lot of unbranded, run the whole into market, and so soon as the boat load was landed parties owning about one-fortieth part (namely, the branded staves) would replevy the whole load. The result was litigation, of course, and the man who owned the staves lost all, because he was caught in bad company. People often take great risks, and like the dog swimming the river with his bone, seeing the shadow of it in the water, undertook to catch the shadow and lost the substance.

"Now railroads are being constructed through the forests, and the old way of taking great risks at drifting timber is gradually playing out; timber is being shipped direct, and stave factories in mountains are frequently visible now, where it was impracticable before means of transportation had been furnished. This is where the cylinder saw for cutting staves and the heading saw for making heading is now doing a vast amount of stave and heading making about which and all other machinery used to make barrels, we shall talk in our next number."

COOPERS' CHIPS.

Wood & Co., of Nixon, Ont., are quitting the cooperage stock manufacturing and selling off their stock.

C. W. Smith, of Strathroy, has sold his cooperage business to Chas. Scott, and has entered into business at London, Ont.

In view of the bright prospects for a large demand for apple barrels, C. W. Smith, of London, Ont., reports selling a large number of barrel heaters.

D. W. Wylie, of Arkona, Ont., has taken his brother into partnership. The new firm are putting in hoop machinery, and will make full lines of staves, hoops and heading from now on.

A call for 25 lb. kegs of flour for the Newfoundland trade, E. D. Tillson, of Tilsonburg, shipping in this manner, and of $\frac{1}{4}$ kegs for South America trade are recent developments in cooperage business.

A new idea about making metal barrels to be used for the same purposes as wooden barrels, is to form hot sheets of steel into half-barrel shapes by hydraulic presses, and then weld the halves together by electrical process.

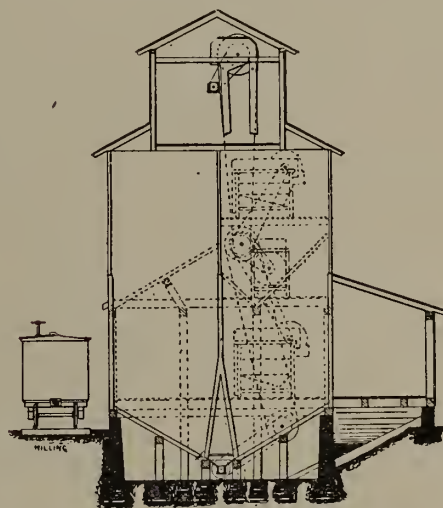
Washington spruce is said to answer well the requirements of tub and box makers who must use a wood that will not impart its flavor to the contents of the package. This wood has no taste whatever, and the most delicate compound is free from taint if packed in a Washington spruce package. It is especially recommended for butter packages.—Woodworker.

One of the very largest manufacturers of butter tubs informed us recently that spruce of the Washington or any other variety, was not considered desirable for butter packages.—Coopers' Journal.

DESIGN FOR A SMALL ELEVATOR.

THERE is scarcely a town or village, remarks Milling, surrounded by fields of waving grain, which does not possess an elevator or a flouring mill. No community prospers as it should without either one of the other. A small town located in an agricultural district depends largely on the farmers' trade, and every possible inducement should be offered to attract the tiller or the soil. Of all the products of the farm which are brought to town and turned in for groceries, dry goods, etc.; of all the edible grains brought to market, including corn, oats, rye, barley and wheat, wheat is pre-eminently the first in importance, has become the chief article of diet of the human race in general, and has most properly gained for itself the title "staff of life." Wheat may therefore be considered the staple article which governs the advancement of a small country town, and it, in turn, largely influences the good fortune of our large cities.

In years gone by, when the price of wheat was held at a reasonably high standard, and when the farmer could enjoy a good night's sleep without worrying as to what the price of wheat might be the following morning; also when a fluctuation of a few cents did not concern him much, and when the distance to the mill was much greater than it is now, and roads in bad condition a large portion of the year, it was customary for him to have his warehouse or granary on his own farm. While this is still the case with many of our wealthy farmers, there are a great many who cannot afford to hold their grain from one season to another for the purpose of



END ELEVATION.

seizing a favorable opportunity to sell. It is this condition of affairs that has brought about the erection of small elevators in country towns. If we look back fifteen or twenty years we are reminded that the small elevator was then scarcely known. In these times the average farmer can better afford to store his grain in the nearest elevator than build warehouses of his own away from the purchasing point. He will get just as big prices for it, and is freed from the trouble of seeking customers. If elevator men do not buy, the cost is very small to keep it in store until somebody comes along and pays what is asked for it. The chances are, also, that about the time when a price may be offered, such as would suit the farmer, he would not be aware of it, or perhaps the roads would be in such a condition as to make it a cumbersome task to get to town. Hence, elevators are necessary in every community surrounded by farms, if for nothing else, for their convenience and security. The town merchants will also receive their share of gain, and to see farmers' teams tied to the railing surrounding the town square is encouragement to them.

But the building of small elevators has not become the science that mill building has in these days, perhaps because they are not looked upon as of equal importance. In fact it is as much of a difficult undertaking to construct an elevator, large or small, that will work satisfactorily, as to put up a mill and make it run smoothly. It cannot be hewn out with a hatchet and erected by the eye. A design, a plan and practical superintendence are essential in its construction.

Elevators, even though they be of small design, are

built in great variety. There are always numerous circumstances, of course, which have a tendency to govern the principle features and general design of an elevator. Among them are the following:

Relative position as to street and railway.

The kind of power used.

The manner in which it is applied.

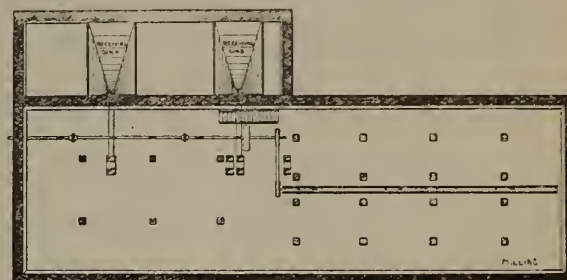
The nature of the soil on which the structure is to be built.

The different kinds of grain to be handled.

To what extent the grain is to be cleaned.

Whether grain will be received from cars as well as from wagons, etc.

The accompanying drawings represent an elevator which can easily be adapted to the handling of various

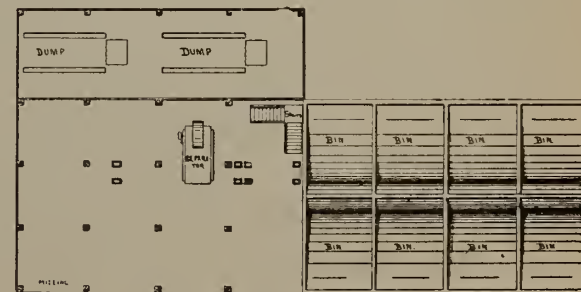


BASEMENT.

kinds of grain. In this particular design we avoid extreme height as much as possible, which is frequently a desirable feature, particularly in windy countries. By having the cleaning machinery centrally located, the handling of the grain is very much facilitated. A fair idea as to the general arrangement is shown in the side and end elevations. The main storage bins are the full height of the building. The crib work is composed of 2x6 and 2x4 studding. We desire to call particular attention to the manner of constructing the passage way. This is done by locating the studding on edge, and is very much simplified by thus doing away with the abrupt jog at the top and, if anything, is made considerable stronger. The hopping can also be laid on edge, which will do away with the necessity of flooring. The hopping will also naturally clean itself better by having the wheat to follow the grain of the wood in being discharged. Besides it will also thus act as a brace and will very materially add to the strength. This same style of hopping may be applied to the shipping bins and to the other bins located above the main working floor. The construction of the latter two series of bins are shown in the end elevation by dotted lines.

By having the machines located as shown they can be reached easily and quickly from the main working floor. A friction clutch is provided for the purpose of disengaging the cleaners when desired not to run them and still operate the elevators and conveyors for receiving or delivering. The connecting machinery is reduced to a very small amount.

The receiving of wheat from either wagons or cars need not interfere in the least with the delivery of wheat



FIRST FLOOR.

to the shipping bins. It would hardly be practicable to have large hopper scales for the purpose of weighing in or out and wagon and track scales would have to be resorted to. A large hopper scale might be introduced and located in the space occupied by one of the smaller bins, or a small one could be used on the grinding floor. It seldom occurs in a small elevator, however, that any weighing is to be done in transferring from one bin into another, in fact the principal part of the work consists in receiving and delivering.



Office of the CANADIAN MILLER,
June 8, 1894.)

THE GENERAL SURVEY.

LITTLE, if anything, in the way of novelty can be written of market conditions during the month. We continue to reach the lowest point for wheat yet touched. A while ago we were supposed to have got there, but the unexpected continues to happen, and there are those who feel they have good ground for the prediction that wheat will yet touch 50c. Though the visible supply of wheat in Canada and the United States has decreased somewhat, as compared with the same period a year ago, there is not much consolation in the fact, when we take a look at the condition of the market generally, and the probabilities becoming more certain that the crop this year will be a heavy one.

Present indications point to a fine crop of fall wheat in Ontario. We have heard of one section where a member of the trade has said the figures will run 50 bushels to the acre. This is likely a somewhat roseate view, but it is not unusual to hear of 30 bushels. Equally cheering reports, if these can be called cheering from the grain dealer's point of view, come from the States, the present prospect being hopeful. With few exceptions, indeed, the outlook for a large crop the world over is bright. So, whatever may be the influence of the visible supply on the markets, it appears altogether certain that we may count on a very considerable invisible supply.

In wheat calculations, however, in the present day, one can hardly look upon a large crop in the United States and Canada as being the all-important factor in fixing prices. The Trade Bulletin, of Montreal, has rather aptly termed Argentina the dark horse, that has upset all calculations in the wheat trade, and proven more than a match for the clever manipulators of the Chicago wheat-pit. We have been talking of a crop of 65,000,000 to 70,000,000 bushels as recently harvested in the Argentine country. This is to be remarked that the amount of wheat afloat from that country for Europe at present is about 16,000,000 bushels, a larger amount than is on the way from any other country. But astonishing as have been these figures to most men of the trade, and important as has been the effect of this crop upon European markets, what are we to think of the word that comes from that country to-day saying that preparations for another crop are being made on a magnificent scale, and that the yield may be expected to be about 260,000,000 bushels?

We have taken occasion before to note the fact that Argentina wheat is said by British millers to be faulty in quality and that some are fighting shy of it. This practice, however, would not look to be very general, for there is no mistaking the information that England is taking large quantities of Argentina wheat. Mr. David Plewes mentions this fact in his interesting letter on another page of the MILLER. Great Britain is encouraged to buy wheat from River Platte from the fact that the vessels bringing the wheat are able to take back good cargoes to South America. As much cannot be said for shipments from this side of the Atlantic. Then there is the difference in cost of labor and living in that country, on which Mr. Plewes places a good deal of stress.

Alexander Bingham, of Liverpool, Eng., who has lately spent some time in New York, has furnished the Journal of Commerce and Commercial Bulletin of that city some interesting figures touching purchases in Europe of Argentina wheat. He points out the fact that in the 17 weeks from Jan. 1 to April 15, the imports of Argentine wheat in Great Britain and for orders aggregated 2,344,500 qrs, against 2,867,000 qrs for the whole of the preceding year, while the continent, in the 17 weeks named, had received 657,500 qrs, against 1,066,000 qrs in the whole of 1893.

"These figures," said he, "show that the United

Kingdom is getting 1,000,000 qrs or 8,000,000 bus per month from a country that last year gave us 550,000 qrs per month, and nothing at all a few years ago; while she has yet 5,000,000 qrs or 40,000,000 bus to give us on this crop."

Continuing, Mr. Bingham said: "Nor is this all. There is no premium on forward shipments from that country; so that Europe can contract for her supplies as far ahead as the current crop deliveries run, at the same price as spot wheat, and thus save the carrying charges which are added in America to the price of cash wheat. This is the power that has kept the Liverpool market down, and with it the American markets; for it enables European importers to buy Argentine wheat to suit their wants ahead for the crop year, and not only to get it carried for nothing, but also to sell the future months here at the premium, or carrying charge, against its Argentine purchases, and thus insure them against any losses on a declining market. In this way the United States has not only to carry its own wheat for nothing in the end and stand its losses on its own crop on a declining market, but it has also to pay the losses on the surplus crop of Argentina, and, in fact, all other exporting countries where the option system is not in operation."

"Further," said he, "if today's quotations in Liverpool for fair average quality of Argentine wheat is correct, namely, 4s per 100 lbs delivered in Liverpool, with no premium for several months ahead, the inducement to buy Argentine instead of American wheat is still greater. Say Argentine wheat is worth 4s for September delivery in Liverpool, and taking September delivery of wheat in New York at current quotations and ocean freight at the present exceedingly low figure of 1d per bu, the American wheat would cost 4s 4½d in Liverpool, against 4s for the Argentine, which, a fortnight ago, was bringing as much on the spot in that market as American contract No. 2 red."

We will continue to hope for better wheat prices in the future, but evidently more than one serious contingency has to be counted on.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—Winter wheat, 59c. to 60c.; spring, east, 60c. to 62c.; Manitoba, 70c. to 71c. west for No. 1 hard. Trade Bulletin of Dominion Millers' Association says: "Car wheat worth 61c. to 62c. on track. Manitoba wheat No. 1 hard, 69c. west and 69c. to 71c. east. Via North Bay, hardly anything offering. Via Sarnia none. Montreal, No. 1 hard Manitoba wheat, 76c. to 78c.; No. 2, 73c. to 75c." Chicago: A dispatch of the 6th says, "wheat rushed up at a dizzy gait to-day finishing with 3¼c. gain." Extremely bullish crop reports explain this. Quotations are as follows: No. 2 spring wheat, 57¾c. to 57¾c.; No. 3 spring wheat, 57c.; No. 2 red, 57¾c. to 57¾c. Buffalo: Spring wheat, No. 1 hard, 67½c. to 67¾c.; Northern, 66½c. to 66¾c.; No. 2 red 60c.; No. 1 white, 62c. Duluth: No. 1 northern, 60½c. for September; No. 1 hard, 67¾c. for July; No. 1 northern 60¾c. St. Louis: 53c. for cash; 56¼c. for July; 55¾c. for August; 57¾c. for September. Toledo: 57¾c. for cash; 58¾c. for July; 59¾c. for August; 61c. for September.

BARLEY—Toronto—Very little doing though a light demand for feed. Quotations about 38c. and 39c. Oswego: The market for Canadian barley very quiet. Light receipts and shipments.

OATS—Toronto—It is thought by some that there are large quantities of oats in some parts of the country and that later prices will drop. At present, however, prices remain firm; sales effected at 37½c. and 38c.; 33½c. and 34c. for white. Montreal: No. 2 oats in store, 39c. to 40c.

PEAS—Toronto—Not many transactions. Prices run from 65c. to 70c. Montreal 69c. to 70c.

RYE—Toronto—Practically nothing doing. Montreal quotes 51c. to 53c.

THE FLOUR MARKET.

THAT it might be different is the wish of flour millers. But the story must still be written that trade is as dull as ever. Locally a hand-to-mouth trade continues. It is very little export business that is doing and when done it is too often of an unprofitable character. The following extract from a letter of a miller, west of Toronto, to

a Montreal concern, and dated May 26th, shows just how millers are disposed to look at the export business. The letter reads: "The offer you make me for the two cargoes is altogether too low, as it would not, I assure you, cover first cost; but if you would take the whole lot I might consider it, as it is not always a case of profit in these hard times so much as keeping things running." The price offered for the two cargoes of rollers, it is said, was equal to \$2.85 laid down in Montreal. It is quite unnecessary to point out the demoralizing character of business along these lines. No better encouragement is found for export of flour to Great Britain. Everything there is flat.

PRICES OF FLOUR AND MEALS.

TORONTO—Flour: (Toronto freights). Car prices are, Manitoba patents \$3.70 to \$3.75; Manitoba strong bakers' \$3.45 to \$3.50; Ontario patents \$2.90 to \$3.00; straight rollers \$2.60 to \$2.70; extras \$2.40 to \$2.50; low grades, per bag 85c. to \$1.00 Bran \$14.00. Shorts \$17.00. Trade Bulletin Dominion Millers' Association, says of Ontario flour, bran, etc.: "Sales of straight roller \$2.60 and 90% patent at \$2.65 and \$2.75 f. o. b. for Lower Province; bran \$14.00 and \$15.00 middle freights west; shorts \$15.00 and \$16.00 f. o. b."

MONTREAL—The flour market shows a little activity. We quote patent Spring \$3.50 to \$3.65; superfine \$2.35 to \$2.45; extra \$2.40 to \$2.50; straight roller \$3.00 to \$3.05; strong bakers, Manitoba \$3.40 to \$3.50. Meals: granulated in bbls. \$4.20 to \$4.35; granulated in bags, \$2.10 to \$2.20; standard in bbls. \$3.95 to \$4.00; standard in bags \$1.00 to \$2.00. Feed: bran \$17.50 to \$18.00. Shorts \$18.50 to \$19.00.

FLOUR IN MONTREAL MARKETS.

COMPLAINTS are rife, says the Montreal Trade Bulletin, of the demoralized state of the flour trade, for instead of low prices bringing increased consumption, millers, both here and in the West are asking dealers the question: "What are people living on?" A miller stated on 'Change a few days ago, that orders were coming in very slowly from outside points, causing him to wonder what the reason was. Another party stated that "the Newfoundland trade was being supplied almost exclusively by American flour, which could be bought at lower prices than Ontario millers were willing to sell at." For instance, American choice extra flour is offered at \$2.15 laid down here, and American straight roller flour at \$2.70. Although these grades may not be fully as good as Canadian of the same descriptions, they appear to answer the same purpose, and this is no doubt one reason why Ontario millers find the demand so very slack, as 25c. to 30c. per bbl. will hide a good many small faults. Michigan patents have also been offered at \$3.25 laid down here, said to be of very good quality; and if this great difference in price between Canadian and American grades continues, little if any Newfoundland trade may be expected in the former. There has been some business in Ontario patents for Liverpool and Glasgow account, but at very diminutive rates, which, notwithstanding, keep on diminishing. Of course the high price of mill feed has helped to make amends to millers for the low value of flour; but even allowing an ample margin therefor, the flour milling industry has had a long list of unfavorable circumstances to contend against, second only to the extended depression in wheat.

TRADE PAPERS AS AN ADVERTISING MEDIUM.

THERE are scores of business men, says the Journal of Building, who, when told that the circulation of a trade paper is 3,000 to 4,000, are inclined to ridicule its claims as an advertising medium, not knowing that a single edition of a trade paper, a circulation of 1,000 copies, reaches more persons whom they wish to reach than the issue of a daily paper of 100,000 copies. Those who may be surprised at this statement and imagine that the figures are incorrect may easily convince themselves of their error by referring to the commercial agency reports. To reach the consumer of general merchandise the daily papers are a valuable medium: to reach those particularly interested in trade, the trade papers alone cover the field.

PRICE OF WHEAT.

PURSUING at further length the subject discussed in the April CANADIAN MILLER, Mr. James B. Campbell, of Montreal, has written a second letter to the Globe, the main arguments of which are here reproduced. It is hardly likely everyone will agree completely with the conclusions reached by this writer. Already these have provoked some discussion in these columns, pro. and con. The broad question itself, however, handled by Mr. Campbell, is full of promise to the commercial interests of Canada, and will bear, and ought to receive, the fullest consideration.

Events of the past year have shown unmistakably how seriously the entire commerce of the country becomes depressed when the products of the farm are depressed. Whatever steps can be taken to give improved markets to these products, and especially to wheat, as the leading product, will act with a rebound on all the arteries of the body-commerce, and the pulse of trade will beat with vigor and healthfulness. Mr. Campbell believes he sees in enlarged transportation methods, a solution, in a large extent, to this problem. Millers have a vital interest in the question and we shall be glad to have the thoughts and opinions of our readers on the subject. The following are Mr. Campbell's views:

The trade in wheat is demoralized. Over production, the development of wheat-growing in cheap labor countries and cheap transportation have had much to do with it, but the system of trading carried on in America has materially assisted in the downward run. The rule on the New York as well as on the Chicago Board of Trade is that either winter or spring wheat may be delivered "regular" on contracts. That is, that when a buyer contracts for a given lot of No. 2 wheat for delivery in a future month, the seller shall have the right, under the rules of two boards, of delivering either winter or spring wheat in fulfilment of contract. I was in business on the Chicago Board of Trade when that rule was passed. There was a great cry raised about making Chicago a winter wheat market, and doubtless some receivers looked forward to an increased business: but the majority voted for it, because with winter wheat "regular," the difficulty of running a "corner" was immensely increased, and to just that extent was the security in short-selling increased. The majority of men on the Chicago Board of Trade are "bears"; they wish to get prices down; they desire to sell what they have not got and what they know they never will have, except to off-set a contract already made, and they bear the market with unlimited amounts, subject only to their ability to margin. No man can run a wheat "corner" unless a number of men have contracted to deliver vast quantities of wheat which they never possessed. As a venture no one will "corner" the real article alone, there must be some "shorts" to be squeezed. Any system or rule which permits men to sell—or contract to deliver—practically unlimited quantities of any article will assuredly depreciate the value of the real property, unless there is a controlling influence to limit their operations. The spring wheat crop of to-day is, to a certain extent, a limited crop, and under the present system it is handicapped with the winter wheat crop which may be offered for future delivery, backed by the "bears" and the buyers have not the right of choice. In the Chicago elevators to-day there are 6,000,000 bushels of red winter wheat which no one wants. It has been held their for speculative purposes too long a time. A shipper of spring wheat cannot afford to buy regular wheat at the market price, for he is almost certain to get this winter wheat delivered him. Generally speaking, he will have to go to Armour or some other elevator man, and at the present moment he will have to pay a premium of from one to three cents, according to the quality, for the particular wheat he wishes. The elevator men can afford to carry the wheat for the present carrying charges, and charge the buyer a premium for the stuff for shipment.

I shall now drop Board of Trade jargon and take up the broader question of wheat in general.

In round figures the winter wheat crop of the United States is 300 to 350 millions; the spring wheat crop 120 to 150 millions. Could the spring wheat States disassociate themselves in trade—so far as their wheat is concerned—from the winter wheat States, they would get more money for their product. It will come to that in

the long run. The evil will cure itself. Chicago will become more and more a winter wheat market, and Duluth will gradually capture the spring wheat trade. In other words Lake Superior instead of Lake Michigan will represent the transportation route for American spring wheat. The fine wheat of Manitoba and the extreme Northwestern States is far above the level of wheat produced in cheap labor countries, but the red winter, inasmuch as it is a softer wheat, does come in on the lower level, and the system of trading in the United States tends to drag the spring wheat down to the winter wheat price.

Last year there was a currency famine in the United States. It is well known that long after the pressure had eased off in the money centres stringency still existed in the country districts. Under this pressure farmers were forced to rush their product into market irrespective of price, and the Northwestern States were no exception to the general rule. It was under these conditions in the neighboring States that Manitoba had to market her crop. "Market" is a misnomer; "slaughter" would be a more appropriate term, for it is a fact that Manitoba farmers were left in the lurch, to receive prices based on the demoralized condition of business existing south of the line, and to tender mercy of New York capital.

They received 45 cents for their wheat at the very time that English millers were ready to pay 87½ cents for it, delivered in England. The difference between the Manitoba price and the English price represents the margin for the buying, the elevator, the freight and the selling. It is far too great, and represents a much larger tax than the producer in Manitoba should be called upon to pay. That there may be no mistake about this assertion I will make it perfectly clear upon what grounds I base it. I quote the following sales from the Mark Lane Express of April 9: "Californian, 25s arrived; Australian, 25s 3d arrived; No 1 Northern Spring, 25s 6d; Finest Manitoba, 26s 9d; ordinary No. 2 Red Winter, 23s 6d, and a sale of the best Duluth is reported at 27s, prompt shipment." Going back to October 2, when our wheat was coming to the elevators, Mark Lane says: "Sales of Red Winter, 26s 3d; Hard Manitoba, 27s; California, 28s 6d arrived Nov. 6; No. 2 Hard Manitoba, 27s 3d; California, 28s, nearly due." I have in another letter quoted sales for end of November and December. It will be noted that the first sale of Manitoba was 9d above the price of Red Winter. By April 9 it was selling at 3s 3d above that wheat. Strange to say, it was only after navigation had closed on the lakes that the quality of our wheat begun to be appreciated on the other side of the water. By April 9 they paid 1s 9d more for Manitoba Hard than for California wheat. There is no reason to suppose that had our wheat had a fair chance English millers would have been paying a less premium for it over Californian in October and November than they were in March and April. Both wheats were of the same crop. Manitoban wheat has stood at a premium above Californian all winter. At 28s 6d for the latter, say 29s 9d for 496 pounds of any wheat, is as near as possible at current rates of exchange, 87½ cents for 60 pounds.

What I complain of is that there is no system of trade or transportation in our country to meet the conditions which exist. We have taxed ourselves heavily to open up a great country. Manitoba is at the head of a great chain of lakes, which represent the cheapest natural outlet to Europe. Her harvest is followed in about ten or twelve weeks by our Canadian winter, which closes the St. Lawrence as well as the Erie. It is impossible to move this dead weight of grain by rail and leave anything for the farmer at present low prices. While it would be an exaggeration to say that English millers are absolutely dependent on our wheat, yet the results gained in mixing with the wheat of Australia and California are such that they do pay a higher price for it than for any other wheat in their market. I believe that the wheat is worth more to English millers than to our millers in Manitoba. The difference in the price surely indicates something of the kind. These English millers want our wheat, and had we a trade ourselves not one bushel could have gone to New York except on an English basis. Where all the wheats of the world come together in competition milling is a fine art, and

the vast quantities of soft, low grade wheat which they get from cheap labor countries make it more than ever necessary for those English millers to use our hard high grade wheat to bring their flour up to grade, and that is why they pay a higher price for it. It cannot be too widely known that in England our No. 1 Manitoba and the grade of the same wheat known as No. 1 Duluth, outsell every wheat in the world. If the obstructions which prevent our producers in Manitoba coming in touch with English millers are not questions for investigation by our rulers, then I fail to see what question is worthy of the attention of the representatives of our people.

Manitoba is a bottled-up country. If she sends her wheat to New York she pays a vast amount of unnecessary mileage, and her product is bound to be slaughtered, while the system of trade and transportation in our own country leaves her in the lurch at the approach of a long winter, and her best wheat is gently squeezed out of her during the freeze-up. However, she has her revenge. Every Canadian in Ontario, Quebec and the Maritime Provinces is paying taxes, direct and indirect, with the result that a handful of men and New York dealers are getting the cream of Manitoba wheat.

There has been a somewhat sudden development of this Canadian water route for the shipment of this Manitoba grain. A good round lot is coming down this way. The stuff is part and parcel of a New York syndicate wheat. Canadians generally, and the port of Montreal in particular, are to be congratulated that although freights were flat and lower in New York, yet New York is waking up to the advantages of the Canadian route. One explanation is, that it was to the advantage of the clique to bring this very cheap fine wheat to New York in the fall of the year, in order to have it to deal out to the millers of Europe during the winter, and now that they wish to get it to Europe direct, they choose the route by which its identity can be best protected. Any little accidental mixing would upset a sale made for delivery.

Transportation is the problem before us. Our best interest is to bring the Manitoba farmer and the English miller closer together. I have in another letter traced the wheat from Manitoba to England via New York. Let us put the extra money into the pockets of those who work for it, and Canadian trade throughout the whole Dominion would vibrate with the new life infused into Manitoba. Ontario and Montreal instead of New York State and City would be the highway for everything represented by Lake Superior. The spring wheat states of the north would not be long in finding out that their interests lay in the spring wheat route of the north, but to do this successfully we must have more tonnage at this port. It is all blocked here. Buffalo did 200,000,000 of bushels last year. We did about 25,000,000 bushels grain and flour. A low tariff—the Finance Minister presumptive says he can do it—figured out to discourage English trade, would be a marked step in the true path. If we are to market this Manitoba stuff, how are we to do it without the necessary tonnage?

On the 25th of last month our Manitoba wheat sold for export in New York for 11½ cents premium over No. 2 American for May delivery. This represents the highest price for wheat in America to-day, and the New Yorkers have got what there was in it. The Americans cannot match our wheat in their own markets.

I am placing this whole question on high national grounds, and I insist that with our wheat crowned lord of all in the chief markets of the world, we need not fear the competition of Christendom or heathendom. In insisting that English millers are our best customers I believe that I have got a hold of the jug by the handle, and it does not take a vast amount of prescience to declare that transportation is the problem to be solved. Better prices north of the line instead of the south of it would soon fill our country up. The trade of say three millions of people in Manitoba instead of three hundred thousand would be felt in every homestead in the Dominion, but if the cream is to go into the hands of a New York syndicate and down to that port, of what good is Manitoba to the country in general? and there is nothing left for herself.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

THE TRANSPORTATION PROBLEM.

To the Editor of the CANADIAN MILLER:

Sir,—With more than ordinary interest I have read the several articles and papers that have appeared in your columns on the transportation problem. This appears to me, beyond any doubt, to be one of the greatest questions that, as Canadians, we need to solve. To the miller and farmer, and when you touch these you put your finger almost on the pulse of the country's commerce, it means more than can be imagined that this question be settled right; and my hope is that the effort the MILLER is throwing into the subject, together with what is appearing generally throughout the press, will be a means of enabling us to get somewhere on the question. Without at this time entering upon a discussion of the question myself, I have this to say, so far as I have studied Mr. James B. Campbell's views, that he has got hold of the right end of the problem.

Respectfully yours,

PROGRESS.

WANTS PRACTICAL INFORMATION

To the Editor of the CANADIAN MILLER:

Sir,—Let me express my pleasure at the added interest that is being given to your journal through its correspondence column. What I would like to see from your readers would be letters occasionally on subjects of practical milling. And as an operative miller it is not likely I stand alone here. Along this line I would like to get information in regard to the "gentle bolter." Some tell us that this is a superior bolting machine, but there are not a few points in connection with it that are somewhat of a puzzle to me. I would like some miller who knows all about the matter to tell me how these reels draw all the material to the buckets in the way that is claimed. I have noticed what seemed to me an intelligent criticism of this machine by a writer in an American milling journal. He says, if a sliding or falling action is the principle for a flour dresser, how is it that, according to illustrations of these machine, the material in these reels show such an utter contempt for the laws of gravity? Again, if the centrifugal force was such when the material left the bottom of the reel, as to hold it to the cloth, what keeps it from flying out of the buckets as it gets higher up in the reel? Who will give us some light on these questions?

Truly yours,

OPERATIVE MILLER.

A VOICE FROM MANITOBA.

To the Editor of the CANADIAN MILLER:

Sir,—Reports that we get from the east would seem to indicate that there is a fairly unanimous opinion in Canada against reciprocity in breadstuffs, but it is a mistake to suppose that in these opinions is reflected the view of the entire Dominion. Ontario millers may consider it a disadvantage to have competition with the United States in mill products. We do not all think so here. I believe I voice a very general opinion in these Northwest provinces in saying that free trade in breadstuffs would be a good thing for this country. Our wheat has established for itself a character that makes it a desirable article in not a few states of the American union. Minneapolis millers know the worth of our wheat for milling purposes, and if this market were thrown open to us, it would enhance prices here. Nor have our people here any large fears of what competition in flour would mean. They believe that the flour from Manitoba wheat would quickly obtain a market in the States that would hold its own with anything that would be produced in United States mills. Were I disposed to enter upon the trade question in a broader light, it seems to me I would find a strong argument for reciprocity generally through the position of all our provinces in one respect or another finding the United States the natural market for one or other of their products and manufactures.

Yours, etc.,

PRAIRIE CITY.

WINNIPEG, MAN., May 31, 1894.

WHEAT FOR FEED.

To the Editor of the CANADIAN MILLER:

Sir,—If it is the case, judging from what I read in the papers, that farmers are feeding a good deal of wheat this season to cattle, why should not we, as millers, encourage this line of policy? Flour is a drug in the market in sympathy with the low price of wheat. Let the wheat market show additional strength and flour would strengthen accordingly. I cannot come to any other conclusion than that, all the world over, our wheat growing countries are expanding too widely, and whilst it may only be a drop in the bucket to curtail the yield, or in any case the sale of wheat for human food, it yet will be a move to some extent in the direction of helping the wheat market. The Dominion Millers' Association might profitably discuss at its forthcoming meeting the feeding of wheat to cattle. The subject, I think, is a practical and immediate one.

Yours, etc.,

OPPORTUNITY.

ONE-BREAK SYSTEMS.

WHEAT cleaning, thorough and systematic wheat cleaning, is of great importance in all systems of milling and in the one-break operation is of vital importance.

It has been maintained that with many breaks and with corrugated rolls much advance cleaning was not needed, the rolls themselves being good cleaning machines. This is in part true, as there is no doubt but that the action of the sharp corrugation does much scouring, but it is done in the wrong place, because while being scoured the wheat is also being broken and flour made, and with this flour the scourings become mingled—united, as it were, to part no more. Then, too, the flour making portions not yet reduced to flour become exposed to and in contact with the same impurities and so vitiated that often absolute purification becomes impossible and the evil effects are felt to the end.

But be the effects of scouring with the rolls in the more lengthened system good or bad, it cannot be done in the one-break system, because there is not the corrugated surface to do it with, there being but one pair in small mills, and if the wheat be cleaned it must be so unassisted by the rolls; but cleaned it must be or no good results can be obtained.

The theory on which a one-break system is based is that first flour, if properly made, is the white flour of the process, no matter of what kind it may be, unless of the lengthened sort above referred to in which the flour is vitiated by the scourings. There being no vitiation of that kind, wheat broken down abruptly and at once is converted into flour that is almost pure white.

To do that corrugations are necessarily dull and differentials extreme, never being less than three to one, and it has been claimed that much greater difference is advantageous.

The principal claim is that with round or very dull corrugations the great variation in the speeds of the two rolls has no abrasive action on the bran; does not cut it nor scrape it, but spreads it out in broad flakes, while gently scraping the flour from it.

While speaking of corrugations, it might be well to add that special and peculiar corrugations have been adapted to one-break and other short methods that is said to be far more effective than the ordinary spiral corrugations, but whether such is true or not cannot be stated with certainty. There seems to be some evidence in favor of some of the special lines, but whether of a strictly unbiased kind, remains for those experimenting in such matters to find out. It can only be said here that it is well enough for every miller interested in the one-break system to investigate such so-called improvements in corrugations that can be viewed from standpoints of common sense and good logic; not that common sense establishes the practical utility of any mechanical device; practice alone can do that; but it will sometimes materially assist in arriving at conclusions as to what to experiment with.

There is no question but that whatever in the way of improving corrugations will in any way benefit the situation or will make broader bran and more flour with the breaking operation is what all one-break millers need, and what they should have if it is obtainable. When we

say more flour, we should also say whiter flour, because it is on making a large quantity of very white flour that the success of the one-break system depends. If that all-important feature is left out of the process, there is but little left in it.

The aim of the one-break system is to approach the old method as nearly as possible, or if it be not it is certainly the effect, as by the old methods the first flour was the white flour and the best flour, it being actually a one-break system with burrs instead of with rolls. But the differences between the two are much in favor of the modern one-break system. The very best and best dressed burrs would cut the bran more or less, which had an injurious effect on the color of the flour, while the rolls, if the corrugations are right, have but little effect on the bran, other than to smoothly peel it off the flour portion, leaving that in good condition.

Then, too, by modern processes the middlings, a portion of which is always necessarily made, are better taken care of than formerly. They can now be purified and made into an excellent flour that can be mixed with the first flour, thus making a very good product of the whole.

The one-break system cannot, however, be safely figured on nor depended upon by those making or intending to make a strictly merchantable flour on a large scale. Its design is to benefit very small millers, who depend entirely upon local or near by trade, and as there are hundreds of small mills of that class scattered all over the south, many of them or the owners thereof, that cannot or do not wish to go at it on a more elaborate or liberal plan, should at least try the one-break, as all can do that if they wish and thereby greatly improve their condition.—The Tradesman.

THEORY AND NATURE.

THERE are, says Power, a good many points where theory and nature have a falling out. The steam utilizes but a small proportion of the thermal value of the fuel it consumes, and its improvement appears to be open only in the direction of higher initial and lower rejection temperatures. The maximum efficiencies are obtained with fiercely hot furnaces, low uptake temperature, high pressures, and high grades of vacuum, giving the greatest available range in both boiler and engine. In the animal organism combustion is carried on at a moderate rate and low temperature, and there is apparently little available difference of temperature in the body, yet as a machine the mule is more efficient than the engine, and will do more work per pound of fuel consumed. The man who finds out the principle upon which this is done, and teaches us to apply it, will be a greater scientist than Faraday, a greater inventor than Watt.

THE POWER OF FLOWING STREAMS.

COMMON opinion respecting the energy or power of flowing streams is nearly always exaggerated, and greatly so. A current of large area conveys an idea of an almost irresistible force, when in fact it represents but a trifling power. The following table, taken from the Mechanical World, will serve to show how little

Velocity of Steam.		Equivalent Head.		Pressure.	Total Energy.
Miles per Hour.	Feet per Second.	Feet.	Inches.	Pounds per Square Inch.	H. P. per Square ft. Sec. Area.
1	1.467	0.033	0.43	2.1	0.0055
2	2.933	0.134	1.62	8.4	0.0445
3	4.4	0.300	3.69	18.9	0.15
4	5.867	0.534	6.42	33.0	0.355
5	7.333	0.834	10.07	52.5	0.694
6	8.8	1.200	14.36	75.6	1.2

work is represented by the current of streams. The force that may be utilized, or the head seen in the third and fourth columns, is very slight, and is the height to which the water will rise when obstructed. This depends, in a measure, on the shape of the obstructing faces. A plain radial current wheel will give not more than two-thirds the work that a well made Poncelet wheel will, because the water will rise higher on the curved floats of the latter named wheel. Current wheels are usually a disappointment, because falling short of their expected duty, and a habit they have of going off in floods.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectively the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

FLOUR FOR HAYTI.

FROM two different sources we have learned this month of particular methods called for in exporting flour to Hayti. A news item on the cooperage page tells of a call from one of our coopers for $\frac{1}{4}$ -kegs for flour from a firm who are shipping to Hayti; and on the same page is mention of the manufacture of $\frac{1}{4}$ -kegs for flour going to Newfoundland. In an interview on the Scribe page with Mr. N. Weatherston, western freight agent of the I. C. R., the information is imparted that in shipping to South America, the flour must all be done up in $\frac{1}{4}$ -kegs.

It is gratifying to learn that a new field in the case of Hayti is being opened out and if our millers watch themselves there is reason to suppose that a certain portion of their surplus product will find a satisfactory market there. The field is a new one for Canadian millers and much will depend on the character of the flour and plan adopted in sending these early shipments, whether the trade will be continuous. It will not do for millers to take the ground, as was done at one time in regard to West India supplies, that whatever methods of packing were employed for local trade would do for this export trade. Not a little business was lost in educating our millers up to the necessity of sending their West India shipments in better packages than were used for trade here. However, that difficulty, we think, has been gotten over. To employ the language of an old adage: "When in Rome we must do as Romans do." It is not necessary to argue why the Hayti people want their flour in $\frac{1}{4}$ -keg packages, enough to know that this is what is called for and it will be a mistake if shipments are made out of the requirements of that export field.

FLOUR TRADE WITH THE WEST INDIES.

CORRESPONDENCE OF MUCH VALUE TO CANADIAN MILLERS.

THE following correspondence, which has kindly been placed in our hands by Mr. N. Weatherston, western freight and passenger agent of the Intercolonial Railway of Canada, is largely self-explanatory, and ought to be helpful in showing Canadian millers, wherein, possibly, they have failed in securing as large a share of trade of the West Indies, as might have come their way. The "St Lawrence" brand referred to in the government analysis is an American flour, which takes the lead in those colonies. In our editorial columns we take occasion to say something on the export flour trade as touching the Indies, Hayti and other points.

DEMERARA, 12th May, 1894.

N. WEATHERSTON, Esq.

Intercolonial Railway of Canada, Toronto.

DEAR SIR,—You will remember we wrote you in 1892 regarding Canadian flours, sending what particulars we could in answer to your request.

We have just been going into the matter again, as our people still complain of quality.

The enclosed analysis and report from our government chemist may interest you, and we shall be glad if the information now given, results in your millers sending down the right stuff for the West India markets.

We are, dear sir, yours truly,

SANDBACH, PARKER & Co.

GOVERNMENT LABORATORY, GEORGETOWN,

DEMERARA, May 8th, 1894.

DEAR SIRS,—Enclosed please find the analysis of the samples of flour which you forwarded on April 25th.

The results of the analysis show that the sample marked "St. Lawrence," is superior to any of the others as a flour for the purposes of bread making. It is, however, closely followed in this particular by the sample marked "No. 2."

The value of the other samples for the purpose of bread making would probably be as numbered.

I do not think that the sample of the last of these was a fairly representative one, as it appears to be a sample of flour made from unripe grain. With the exception of the samples numbered 1, 2, 3, and perhaps 4, the samples are marked by the low proportion of gluten and other albumoid constituents. This results in a want of "body" in the flours, i.e. the flours do not contain sufficient of the constituent albuminoid known as "gliadin" which gives to dough made from flour of good quality, such as "St. Lawrence," its characteristic adhesiveness and power of producing a spongy mass when submitted to fermentation. I should expect that with the exception of the "St. Lawrence" (No. 1), 2, 3 and 4, the samples would tend to yield in varying degrees, heavy, tenacious and saccharine loaves. As a necessary consequence more of these flours would be required to give an "equal sized" loaf with one produced by the "St. Lawrence" brand.

I am also of opinion that the majority of the samples contain a somewhat excessive quality of water. The proportion of this should not exceed thirteen per cent. and in proportion as it exceeds this the flour will exhibit a lack of "keeping" properties. The smaller the proportion of water present in a flour the better suited will it be for keeping in tropical climates.

I am, dear sirs,

Yours faithfully,

(Sgd.) J. B. HARRISON,

Government Analyst.

Messrs. SANDBACH PARKER & Co., Georgetown.

NOTE BY S. P. & Co.:—In the original report Professor Harrison refers to the names of the different brands sent him for analysis. As a copy of this goes to several of our Canadian correspondents, we have thought it advisable to refer to the samples numerically, instead of naming them. Our correspondents will learn, from the analysis forwarded them, the relative merits of their brands as expressed in this report, and shown in the accompanying synopsis.

DEMERARA, 12th May, 1894.

SYNOPSIS OF ANALYSES FLOUR.	No. 1 is analysis of "St. Lawrence" flour. No. 2 is analysis of Canadian flour.									
	1	2	3	4	5	6	7	8	9	10
Water	13.90	15.37	14.12	14.80	14.77	14.80	14.57	15.37	13.75	15.60
Fat	1.95	2.25	2.05	3.36	2.20	2.00	1.45	1.60	1.05	1.75
a. Gluten, albumen, etc.	12.97	12.56	11.37	10.39	9.06	8.63	8.23	7.81	7.78	5.60
b. Other nitrogenous constituents	.68	.44	.26	1.52	.44	.19	.38	.87	1.07	3.25
Starch, dextrine, etc.	70.00	68.91	71.63	69.33	73.23	74.01	75.00	74.08	75.80	73.30
Salts	.50	.47	.57	.60	.30	.37	.37	.27	.55	.50
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
a. Contains nitrogen	2.08	2.01	1.82	1.66	1.99	1.38	1.88	1.25	1.24	.89
b. Contains nitrogen	.11	.07	.04	.24	.07	.03	.06	.14	.17	.52
Constituents soluble in water	5.75	4.25	6.05	5.90	4.80	4.35	3.65	3.70	5.20	4.10
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

No. 1 is analysis of "St. Lawrence" flour.
No. 2 is analysis of Canadian flour.

* Lowest—best.
* Highest—best.

DEMERARA, 12th May, 1894.

The flour on which the rolls are located should be very firm and the machine securely fastened to the floor, so as to allow of no movement or vibration. If the roller machines are allowed to vibrate and swing back and forth, there is but little chance to do the best work. The very best grinding results can be obtained only when the rolls stand as firmly and immovable as the rocks in the hills.

Millers do not so much need a varied experience as do a thorough one. The fact that a miller worked in or had charge of a score or more of mills is not so much in his favor as if he had learned all he knows in two or three mills. The latter proves application and usually ability, while in the former case a lack of both application and ability may be the reason why the experience has been so varied.

BRITISH FLOUR CONDITIONS.

[Special correspondence CANADIAN MILLER.]

AS I see in your April issue, articles on the cause of the low price of wheat, I thought I would drop you a line on the causes, and also on the cause of so little Ontario export flour trade. First, as to the cause of the wheat depression, and the great decline from a point this cereal should never have reached, at the time of the Russian war scare in 1891. At least the amount of wheat then in the world never warranted the prices of that year, and the terrific losses in 1892, on purchases made in autumn of 1891. These conditions so demoralized the trade, and so discouraged traders, there has been no life in business since. Then followed the money panic in United States in 1893, causing the people to force their breadstuffs on this market without any hold up whatever, irrespective of cost. This further depressed prices here. Added to this came an immense crop in the Argentine, forcing their product on an already overstocked market, where a dollar of our money would buy \$2.50 of theirs, and India with her silver currency, where one dollar and sixteen cents of gold here, would buy, say nearly two dollars of silver currency in India. Thus, very small prices here, gave those countries with a depreciated currency, a good price for their wheat. Of course the answer to this is, they have to pay more for the British goods they buy, but the difficulty is they scarcely buy any goods. In India, where they grow so much wheat, the cultivators of the soil live on a little rice.

Now the question arises, when will wheat advance? Hard to answer, but it will come when less is produced than consumption requires and not before. I confess, with most people connected with the breadstuff trade, I thought consumption would overtake supply long ago, but we were all mistaken, and wheat during the past week has sold at less prices than ever, viz: (quoting in your currency and your bushel) 65 cents for Argentine, 67 U. S. red winter, 69½ Canadian white and 77 Manitoba No. 1 hard.

A word or two in respect to Canadian flour trade. Some of my Ontario friends write, why don't you send more orders? Well, I have sent out orders for thousands upon thousands of sacks, which have not been filled because price was too low, but nearly every one of those orders would have been filled if the freight on flour had been same per 100 lbs. as on wheat, and unless this can be obtained I cannot give much encouragement for export trade, even should markets advance. Ten or fifteen years ago Ontario did a large export trade in flour, because then our milling plant and facilities were superior to Great Britain, but this is all changed now, and no country in the world has better flour mills than Great Britain, especially England and Scotland. Hence we have now to be put on equal freight terms with British millers, or we cannot successfully compete. It is not a matter of low freights, I believe you have that now, but a matter of comparative freight. I know that the wheat freight is taken on large contracts, and as a rule very large contracts can be made at less freight than a few car loads, especially when freight is connected with ocean freight. A long while before I left Ontario I advocated a pooling arrangement on flour and oatmeal freights, arranging with some one man to make the contract, each miller lodging a deposit with the freight contractor that he will fill his share of the contract. There is still an opening here for your surplus flour if your millers are put on equal freight terms with those against whom they have to compete, and I think if the Ontario millers would make a united effort, they will get some relief from the unequal freight difficulty, against which they have to contend at present.

DAVID PLEWES.

LIVERPOOL, Eng., May 12, 1894.

Remember that as a general thing quality is of more importance than yield. If a miller has a reputation for the excellence of his brand of flour, and gets a price accordingly, he is in a position to make money and must at all times preserve the excellence of the flour regardless of the yield. If good yields and excellence can both be maintained it is well, but if not, sacrifice yield or else depend upon sacrificing business.

CURRENT COMMENT.

AT a time when American millers are making a boast of their splendid milling system it is somewhat remarkable, that almost simultaneous with progress in this line complaints, continuous and well founded, are current of the deterioration of wheat. Millstone says on this point: "The greatest problem in milling is the general improvement of our wheat. As the quality of our milling systems and machinery has improved the quality of our wheat has deteriorated. There is much truth in the boasts of old millers that good stone flour of a quarter of a century ago would compare favorably with the average of roller flour now. It is as true that the wheat of the present could not be handled at all now with the crude apparatus of the old system as that really good wheat produces much better flour now than good wheat did by the old process. In the older States the soil has become, or is becoming exhausted, the berry is not so plump nor its nutrient qualities so strong. American farming methods have been careless, and tons of the richest material have been taken off the lands where pounds have been put back into them. The principal reason why spring wheat flour is stronger in gluten is owing to the virgin richness of the soil. But even now deterioration is evident in the older spring wheat districts, and the time will surely come when the spring wheat will lose its pre-eminence for strength, as it has successively been lost by New York, Ohio, Indiana and Michigan. Climate may modify this somewhat, but it cannot prevent the final deterioration of wheat in all sections unless farmers become wiser, and apply measures that will keep up the soils. Improvement is noticeable in many sections, and it is also noticeable that the mills in those sections are the ones that produce the best flour at the least expense."

Commenting on the discussion that has been going on in these columns regarding reciprocity in flour, the Commercial, of Winnipeg, says: "The principal interest in this reciprocity clause centres in wheat. In Manitoba the farmers would be in favor of reciprocity in wheat, as they could sell to Minneapolis millers. Some of the grain shippers are also in favor of free wheat, as they could sell in or ship through the United States with less trouble from customs regulations than at present. While Manitoba would be able to sell wheat to Minneapolis millers, reciprocity in this grain would also enable eastern Canada millers to buy Duluth hard wheat, so that while some advantage would be gained, the present monopoly which Manitoba hard wheat has in Ontario would be lost. Eastern Canada millers are now obliged to use a certain quantity of Manitoba hard wheat, and in some seasons they have had to pay a sharp premium for it, which has been a benefit to the western producer. If they were able to go to Duluth and buy, it might cut off some demand for Manitoba hard. As a general rule, however, the markets are relatively the same on each side of the boundary. Reciprocity, however, would probably increase the competition in Manitoba for wheat, and the advantage to the farmer would be in favor of accepting the offer. Western millers would find their eastern flour trade cut into by Minneapolis and other hard wheat millers, but they would have free access to the larger markets in the eastern States, in competition of course with Minnesota and Dakota hard wheat millers."

Novorossisk, the new Black Sea port of Russia is frequently spoken of, says a writer in the Pall Mall Gazette, as the "Chicago of Russia," and contains three immense elevators, with a capacity for 3,000,000, 4,760,000, and 3,200,000 pounds of grain respectively. (One pound equal to about 36 lbs. av.) Much of the success of the port is due to the energetic management of the Novorossisk and Vladikavkaz Railway line, which brings the port into communication with the rich grain-producing districts of the Caucasus and connects with lines from other grain-producing districts of Russia. It is anticipated that before long a large amount of grain from South-western Siberia and from Central Asia will reach European markets by means of this railway. The line at present carries annually some 60,000,000 pounds, and at stations on it eight elevators have been erected for storage and cleaning purposes, each with a capacity

of from one to two million pounds of grain. All things considered, the growth of Novorossisk, which five years ago was but a sleepy little fishing village, and now is second only in importance as a grain port to Odessa, is one of the most remarkable events in the history of European commerce.

THE United States is not in it, when the carrying trade by water is considered. The amount of grain exported from the port of New York during the year 1893 was 55,768,726 bushels. Of this 23,400,046 bushels were wheat, corn, rye, oats and barley, the balance being buckwheat, flax seed and peas. This quantity was less than that of the preceding year by 18,061,780 bushels. Of this grain three cargoes were sent out in sailing vessels, 171,427 bushels—one (British) carried 107,765 bushels, and two (German) carried 63,662 bushels; not one American. By steamers there were sent off 55,597,299 bushels, in 1,022 cargoes, in 324 vessels. Of these there was one American the Chester, which took 16,357 bushels of wheat to Southampton. But there were 217 British vessels employed, which carried 604 cargoes, amounting to 34,259,656 bushels, a great deal more than half the export. Next came the Germans with 40 vessels, which carried 4,292,737 bushels in 128 cargoes. The Dutch had 11 vessels and took 92 cargoes amounting to 4,651,111 bushels. The Belgians had 12 vessels and took 76 cargoes, or 5,240,242 bushels. The French had 15 vessels employed, which took 2,400,469 bushels in 43 cargoes. The Portuguese had 6 vessels and took 29 cargoes, in all 2,213,108 bushels. Four Norwegian vessels took 124,502 bushels, 7 Spanish took 597,149 bushels and 6 Italian 813,516 bushels.

EXHAUST STEAM.

THE use of exhaust steam is the more profitable as the percentage of the steam utilized is increased, and as the back pressure produced by its use is reduced, if we add back pressure to an engine we increase the mean pressure required upon the piston in order to maintain a given mean effective pressure: that is, we increase the horse power of the engine, so far as the boiler is concerned, by an amount equal to the horse power constant multiplied by the back pressure added, and require a proportionately greater supply of steam. The condensing engine may be considered in the same way. Suppose we have an engine which develops one-horse-power for each pound of mean effective pressure running on a mean effective of fifty pounds, an absolute back pressure of five pounds, and a steam consumption of twenty pounds per hourly horse power. If we cut off the condenser, and exhaust at atmospheric pressure, we shall have added ten horse power to the work of the engine, requiring two hundred pounds of steam additional per hour. As this additional horse power is used in overcoming the increased back pressure, the effective horse power remains at fifty, and the steam consumed per effective or indicated horse power per hour is increased twenty-five per cent. Now if we have an application for as much or more heat as would be furnished by two hundred pounds of boiler steam we can take it profitably from the exhaust. If not, it would be better to use steam direct from the boiler.

POSSIBILITIES OF SPEED BY STEAM.

IN his recent inaugural address, the president of the French society of civil engineers, M. du Bosquet, pointed out that express trains daily attain seventy-five miles an hour on down grades, providing that such speeds are not dangerous. But the engines are not sufficiently powerful to maintain such speeds on a level. A draw-bar pull which would give seventy-five miles an hour on a down grade of one in 200 would give only fifty-seven and a half miles on a level, and thirty-one and a fourth miles on up grade of one in 200. A slight increase in the average speed greatly increases the power required. If 322 horse-power will draw a train at fifty miles an hour up an incline of one in 200, for a speed of 125 miles 2,960 horse-power would be necessary. High speeds, moreover, increase the weight of the engines per horse-power, and there is a limit beyond which the engines could not move themselves. At their maximum power, the modern French locomotives weigh about 158 pounds per

indicated horse power; but a similar engine of 150 tons, generating 2,000 horse-power, would be required to draw a train of 100 tons up a slope of one in 200. The highest possible speed for such an engine and train up the slope would be eighty-seven and a half miles an hour, and for this the engine would weigh 670 tons and would generate 8,932 indicated horse-power.

THE GOOD OLD TIMES.

A MONTREAL wheat bull, as he thought of the condition of the wheat market, sighed: "Oh! for the good old times when old Hutch sent up September wheat from \$1.25 to \$2.00 within about a couple of weeks. The old boy would walk on to the floor of the Chicago Board of Trade with a slouch hat on, give the wink to his brokers, and up would spin prices at the rate of 3c. to 5c. in a single forenoon, and there they would remain until the next advance set in on the same afternoon or the day following. In these times, however, if the market moves up $\frac{1}{2}$ a cent or a cent the cry goes forth, "she's booming," and then the boys stand drinks all round."

WHY PULLEYS RUN UNSTEADY.

CENTRIFUGAL force has less to do with making a pulley run unsteady than the mere tendency it has of trying to get where it can rotate about its own centre of gravity. A wheel is generally looked upon as so much weight, and, if held off its centre, must go switching about like a heavy stone in a short arm sling, tending to pull the machinery to pieces. This may be well enough for a start, while the wheel is getting up to speed, but the time soon comes when the wheel will turn to its own centre and let the shaft swing for a while. Just notice how the juggler can seize a dish of any kind, as a dinner plate, for instance, and throw it up with a whirling motion, and while in the air, catch it on the end of a stick and cause it to rotate with ease. At first the plate is switched about by holding it off to one side of centre, but as the speed increases, it gradually brings the point of support near the centre, till at last it is allowed to spin on its own centre of gravity. In this case all the driving power, supporting force and the resistance of the load were brought to one single point, with nothing to react upon but the inertia of the plate.

THE REASON WHY.

AN engineer observed his steam gauge indicating a higher pressure than his safety valve spring was set for. He slackened the spring, but the gauge kept rising and the steam did not blow off. When the pressure rose to 200 pounds he became alarmed; and as he could not start the engine he started the injector and opened the water blow-off cock. The damper being closed, this had the effect to prevent further increase of pressure. On examining the safety valve it appeared that the brass seat of the valve was a bushing put into an iron casting, that it had become loose, and that the steam had pressed it up against the valve. As the valve rose the seat followed it, and there could not have been a release of steam until the bushing was pushed out of its hole.

CAUSES OF EXPLOSIONS.

THE causes of explosions may be summed up in one sentence, namely, lack of strength to withstand the pressure. This want of strength may be due to faulty construction, but as a rule it is due to some acquired weakness, unknown simply because unlooked for. Weakness results from unequal heating, which produces unequal expansion, from corrosion, improper setting, scale, low water and want of circulation. It may not always be possible to avoid unequal heating, as for example, in getting up steam many boilers will be hotter in some parts than in others, but scale can be prevented by "boiler compounds," and low water by a little care. In some types of boilers no provision is made for water circulation, and unequal heating is bound to occur. A thorough inspection from time to time will inform the engineer if his boiler is weakened by it, but the best plan is to use some other type. To sum up, the engineer must understand and act upon the motto, "eternal vigilance is the price of safety."—Safety-Valve.

THE NEWS.

CANADA.

—A grain elevator is to be erected at Wyoming, Ont.

—Mr. T. E. Argue will erect a grain elevator at Carp, Ont.

—A new roller flour mill is being erected at Ruther Glen, N. B.

—At St. Henri Mission, N. W. T., a new flour mill is being erected.

—The roller flour mill at Ashburnham, Ont., will shortly resume operations.

—The Assiniboia roller mills at Moosomin, N. W. T., are being offered for sale.

—Messrs. Dow & Curry have completed their new oatmeal mill at Pilot Mound, Man.

—The business of the Macfarlane Milling Co., Magog, Que., has been purchased by Messrs. Dastous & Co.

—Mr. D. C. Fleming, flour and feed dealer, Shoal Lake, Man., has removed to Binscarth.

—The flour mill at Weston, Ont., was damaged by a recent flood to the extent of about \$3,000.

—The grist mill at East Toronto has been compelled to close down temporarily for lack of fuel.

—Mr. W. P. Niles is building a grain elevator at Wellington, Ont. The building will be fireproof.

—It is estimated that about 2,000,000 bushels of wheat is held by farmers in Manitoba and the North-West Territories.

—Mr. J. K. Blain's grist mill at Stirling Falls, Ont., was destroyed by fire recently. Loss, \$3,000. Partially insured.

—Mr. E. D. Tillson, of Tilsonburg, Ont., has received an order from Hanover, Germany, for a carload of his celebrated oatmeal.

—The Ogilvie Milling Company, of Winnipeg, has donated five tons of flour to the sufferers by the recent floods in British Columbia.

—Doherty's lumber, carding and grist mills at Campbellton, Ont., were burned about a fortnight ago. Loss, \$12,000. No insurance.

—Messrs. Moody & Son, of Orangeville, will operate a grist mill in Dundas, having taken over the old property formerly owned by the late John Wilson.

—Free water and exemption from taxes for two years will be offered Messrs. Cargill & Co. for the erection and operation of a 150-barrel flour mill in Vancouver.

—Buctouche N. B., rejoices in an establishment in which is combined a butter and cheese factory, carding mill, grist mill, wood turning and fruit canning establishment.

—A report is current that a Minneapolis and Duluth syndicate will erect a large elevator at Owen Sound, and operate a barge line between the head of Lake Superior and that place.

—Mr. James Ireland has disposed of his oatmeal mill at Wroxeter, Ont., to Messrs. Robert Black and John Barnard, who will carry on the business under the style of Black & Barnard.

—The flour mill at Marquette, Man., which was recently destroyed by a boiler explosion, has been rebuilt. New machinery is being added, and operations will be begun at an early date.

—Messrs. Joyner & Elkington, of the Qu'Appelle Valley, Assa., flour mills, have recently put in a new steam plant and increased their capacity to 120 barrels per day. They contemplate building an elevator.

—Messrs. Bennett & Constable, Spencerville, Ont., are placing in their flour mill a new 65 horse-power Corliss engine and a 70 horse-power boiler, built by Cowan & Co., Galt, Ont., as an auxiliary to their water power.

—James A. Band, a miller in the employ of the Norris estate, at Thorold, Ont., and who, with his father, had charge of the mill for some time, was found dead in the mill office a few days ago. It is supposed he committed suicide.

—The flouring mills at Smithville, Ont., have been leased by Messrs. Heslop Bros., who will control them in addition to their roller mills at Fort Robinson and Wellandport. Mr. R. T. Heslop will manage the mill at the former place.

—Messrs. Ross & Muir are erecting a grist mill at Mattawa, Ont. It is also their intention to install an electric light plant in their mill if satisfactory arrangements can be made for lighting the town. According to their agreement with the town, the mill is to be not less than 50 barrels capacity per day, and is to be completed by the 16th of October next.

—Application will be made to Parliament for the incorporation of the Virden Milling Co. The incorporators are: J. F. Frame, W. J. Kennedy, J. J. Caulfield, W. J. Wilcox, H.

Cathcart Simpson, J. Saunders and Robert Trumbell, all of Virden, Man. The object is to build and operate a flour mill and grain elevator at that place. The capital stock will be \$12,500, divided into 500 shares of \$25 each.

—A recent issue of the Winnipeg Commercial says: Hon. Mr. Bowell has been advised that two British millers, Messrs. Wilson Marriage, of Colchester, and Wm. Neave, of Fording Bridge, Hampshire, England, are coming to Canada this summer for the purpose of seeing the methods of cultivation adopted by the farmers, and also investigating into the system of storing and forwarding wheat and the way in which business generally is conducted. They have formed a favorable opinion of the value of Manitoba wheat for milling purposes, and wish to make arrangements if possible by which they can rely upon a regular and direct supply.

GENERAL.

—The quantity of wheat in Chicago a fortnight ago was estimated at 19,205,000 bushels.

—A new disease, a white microbe, has attacked the wheat crop in the districts of Vendee, Brittany and Anjou, France, and is inflicting great damage upon the growing grain.

A REVOLUTION AVERTED.

THERE was quiet in the mill. The hum of industry had gone out for the night and the darkness, like a hat, was felt. But anon a still, small voice came from the coal pile and it was heard to say to the machinery: "You fellows have been making so much noise all day that I couldn't get in a word edgewise, but I want to tell you now that it's a burning shame for me to be called upon to supply the mill with heat and power, and then get all used up, when all you have to do is to lie still and trust to me to start you moving. I think you fellows ought to chip in and do something to make my life easier. It's all very well for you to work me to death and then say, 'peace to his ashes,' but the trouble is that I'm dying all the time, and there'll be so many ashes after awhile that the mill's graveyard won't be big enough to hold them, and part of my remains will be brought in here and choke you fellows up, so I think in self-defence you should let up a little on my energy and give me a chance to recuperate."

"I'm rather dizzy from turning around so much," said the engine band wheel in reply, as he slipped his belt, but I would like to state to our friend coal that we all do just as much work as he," though in a different way, and that he has no especial cause for complaint. My work, for instance, is most monotonous, yet you are all thankful to me for keeping you in balance—or should be—and if I were to stop all would lose their jobs. Now, however, I would like to hear from all those present whether they have any kicks to make. Let each one take his turn."

Whereupon, the crank remarked that he was always supposed to be off his base and as his opinions would be disregarded anyway he saw no use in expressing them. The pulleys said that, like the wheel, they sometimes got dizzy but had not especial complaint unless it was that the oil did not always make it smooth for them, and the shafting said that they always stood in with the pulleys and were bound to go with them unless the belts got tight and couldn't work, which remark was resented by the belts in a body, who said they didn't have any loose ways and didn't propose to take slack from anyone. Here the whistle got in his voice and said he'd be blown if he'd stand so much pressure from the steam any longer, and the steam replied that he wasn't feeling very strong just then, but that in the morning he'd attend to the whistle and if the latter didn't like it he'd give him the worst blowing up he ever had, even if he exhausted himself in the effort. Whereupon, the governor endeavored to control the angry passions that had been aroused and the lubricators attempted to pour oil on troubled waters of discussion, but lo! their efforts were unavailing and even the piston rod made a blow at the cylinder, and the shafting got in a row, so that instead of considering their own grievances, if any they had, they turned against each other and would no doubt have wrecked the mill had not the watchman awakened and bade them all be still and not disturb his sleep. Whereupon, they obeyed, for they felt the power of man—even a nightwatchman who sleeps.

Moral: A row in the family does not bring to the door or help any difficulty with the neighbors.

SIBERIAN WHEAT.

THE word Siberia, says The London (Eng.) Miller, awakens no pleasant associations in the European mind. It at once conjures up a vision of a long train of prisoners wending their dolorous way across bare plains under the lash of brutal Cossacks. Yet in some respects this popular estimate is altogether wrong. Geographers have long been aware that Siberia is a country of very varied resources. This is what that eminent explorer, Baron Nordenskiöld, has to say on the subject:—"Siberia surpasses the North American continent as to the extent of cultivable soil. The Siberian forests are the largest in the world. Its mineral resources are immense, its climate, except the Tundra and the northernmost forest region, healthy, and as favorable for the culture of cereals as any part of Europe." The difficulty has hitherto been to approach this region of natural wealth, as plainly the tedious land journey to Siberia through Moscow is, in the absence of railways, of no use to the British merchant. An answer to this problem seems to have been found by the enterprise and energy of Captain Wiggins, a bold Yorkshireman, who after sixteen years of practical voyaging, has shown that a comparatively easy and expeditious communication between this country and the heart of Siberia is in existence. It would appear that a vessel leaving the port of London at the end of July may confidently reckon on discharging a cargo at Karoul, a port nearly 200 miles up the mouth of the Yenisei, the great waterway of Siberia, and on being back in London without any hindrance from ice floes in the Arctic sea (which it will necessarily traverse) by the close of September. Captain Wiggins has made since 1874 fifteen voyages into these parts, but only once has he encountered any ice in his course, and that was when his departure had been delayed too long. The river Yenisei, which flows into the Arctic sea, is navigable for about 2,000 miles, that is, nearly as far as the frontiers of China, and is provided with many affluents, several of which are also navigable. Moreover, another great river of Siberia, the Obi, which empties itself not far from the mouth of the Yenisei, is likewise believed to be navigable for a considerable distance. With but one transshipment goods can, it is affirmed, be cheaply and quickly forwarded from England to the heart of Central Siberia in something like six weeks. There should be every prospect of a sensible current of trade setting in between the two lands, and if such should be the case, there would be every likelihood of our drawing some supplies of wheat from this great and fertile region. The wheat of Siberia has a good name in Russia, and some of it is said to have a likeness to the wheat of the Canadian Northwest. Before very long our millers may be in a position to judge samples of Siberian wheat with their own eyes.

SINGLE-VALVE ENGINES.

NOT very long ago it was almost universally conceded, says the American Machinist, that nothing in the way of an early cut-off in the cylinder of a stationary steam engine could be accomplished by a single-valve with, at the same time, a reasonably economical steam distribution. This belief prevailed long after the use of the link motion on locomotives, where the steam is so well handled by the operation of the link and single valve as to have kept other means for the most part out of the field. The practice, after it was found that some lap could be added to a slide valve, soon came to the point of making it such as it would cut off the steam at an average for both ends of the cylinder of three-quarters stroke. This was thought to be about the limit to expansion possible with a single valve. Now single-valve automatic engines are made to cut off at as early a point in the stroke as is desirable—many of them being so constructed that the following with steam for three quarter stroke is not possible, and the steam distribution is very good indeed: not equal to that of four-valve engines, but not so much behind in point of economy as would appear probable. The multiplied demand for small engines no doubt have a good deal to do with the perfecting of the governing devices, and with determining that it was not necessary that they be full-stroke machines; and the perfecting of the mechanism has had as much to do with increasing the demand for them.

SHAFTING.*

I NEED offer no apology for bringing a subject of this kind before an Association of Stationary Engineers, for wherever you find a stationary engine you will also find more or less shafting; and if any other excuse were required it will be found in the fact that questions on shafting are quite frequently found in the Question Box at our meetings.

It may be, however, that there are some present who think that as engineers they are not expected to have anything to do with shafting. They may argue something like this: "Our employers expect too much from us; they look for us to wheel in coal, fire two or three boilers, wheel out the ashes, attend our engines and a score of other jobs, as well as find tools for the whole establishment; and it would be just as well not to know anything about shafting, or we would be expected to attend to that too." In answer to such I would say, that it is not often that a man loses his situation by being too well posted, and in this world of changes one never knows when he may be called on to make use of the knowledge he possesses.

It is of the greatest importance that all shafting should be properly proportioned and correctly put up, as it not uncommonly happens that great loss of power and much annoyance results from carelessness or ignorance, and a plant that is otherwise of the best, rendered unsatisfactory.

The first question the engineer has to decide is what size or strength of shaft he requires to do a certain amount of work, and in doing so he must bear in mind that a small increase in diameter will give a large increase in strength. It is not an uncommon thing to hear a man say that such a size ought to do the work, but to be on the safe side will put in a size larger, not knowing that he is adding a much larger factor of safety than he had any idea of. The strength of a shaft varies as the cube of its diameter varies. Let us assume that 1" shaft will safely drive at a given speed four horse-power; a 2" shaft will drive as much more as the cube of its diameter in excess of the cube 1. The cube of 1" is $1 \times 1 \times 1 = 1$. The cube of 2" is $2 \times 2 \times 2 = 8$. The cube of 3" is $3 \times 3 \times 3 = 27$ and the cube of 4" is $4 \times 4 \times 4 = 64$.

Now we assume that the 1" shaft drives 4 H. P., the 2" shaft drives as much more as the cube of its diameter is in excess of the cube 1; the cube of 2 is 8, therefore its power compared with the 1" shaft driving 4 H. P., is $2 \times 2 \times 2 = 8 \times 4 = 32$ H. P., and comparing the 3" shaft with the 1", the cube of 3" is 27 and the power of the 1" is 4 H. P.— $4 \times 27 = 108$ H. P. It must be borne in mind that these figures are comparative and are given to show the rapid increase of strength in a small increase of size, for if we were to use a 3" shaft instead of a 2" we would have 108 H. P. instead of 32 H. P.

Another fact we must not lose sight of is, that the power a shaft will drive is in direct proportion to its speed. If a shaft drives 4 H. P. at 100 revolutions per minute, at 200 revolutions it will drive 8, and at 300 it will drive 12 H. P. The higher the speed of the shaft the smaller the diameter of the shaft to drive a given H. P. Then there is another important consideration in selecting a proper size for a shaft—as they are inclined to bend and also to twist we must take into account the weight of the pulleys and the distance they are from the bearings and whether the strain of the belts is down or the reverse. The bending of a shaft as well as the torsion contributes towards its liability to break, but the bending is the most likely to cause it. The bending also causes a considerable loss in power as well as the liability of belts running to one side of the pulleys. It follows therefore a shaft loaded with pulleys must have a greater number of bearings and the pulleys placed as near the bearings as possible.

To put up a larger line of shafting than is necessary, is objectionable for two reasons; 1st it costs more to put it up; and 2nd it costs more to run it after it is up. The extra weight of the long shaft as well as the larger circumference which has to move through a greater distance will add materially to the friction. There is one other fact I would notice before leaving this part of the subject, and that is, that the second and third lines may be smaller than the main driver. The reason of this obvious, for the first line has not only its own machinery to drive but also the second and third lines with the machinery driven from them.

To make this clear, I have prepared a diagram which I believe will make it plain to everyone. We will call it a mill or factory, and we assume that the machinery in it requires 100 H. P. to drive. The machinery on the first floor requires 45 H. P., that on the second, 30 H. P., and on the third, 25 H. P. Now the shaft A and B are practically one shaft, being coupled together by the gear; so are C and D, and E and F; but while practically one shaft, A has to transmit 100 H. P., while B only transmits 45 H. P., therefore B may be smaller than A. B having absorbed 45 H. P., it follows that C has only to transmit 55 H. P., therefore C may be smaller than A. The machinery on the first and second floors has now absorbed 75 H. P., leaving only 25 H. P. for the third floor, therefore the shaft E and F may be smaller than C.

The same argument will hold good with the shafts B, D, and F. If the machinery which they drive was equally distributed from end to end, then the ends furthest from the motive power might be smaller because they would have less power to transmit, but in practice the disadvantage would be greater than any gain that would be derived from so doing.

I will now give one or two rules to determine the size required to drive a given H. P.

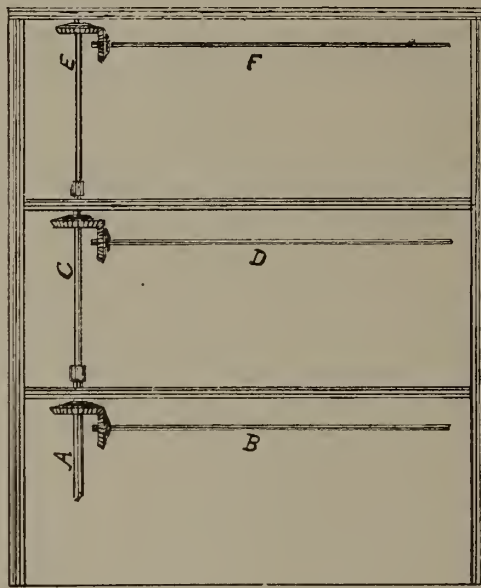
To find the power a shaft will transmit, cube the diameter and multiply by the number of revolutions per minute, and by two, if it is the first line from the engine, and by three if it is the second, and divide by 100.

The crank shaft being the first or prime mover, what power will a 2" shaft transmit as a second mover running at 300 revolutions per minute? $2 \times 2 \times 2 = 8 \times 300 = 2400 \times 2 = 4800 \div 100 = 48$ H. P. If steel add 30 per cent. If this shaft was to be used as a second line then it would be: $2 \times 2 \times 2 = 8 \times 300 = 2400 \times 3 = 7200 \div 100 = 72$ H. P. Where the power required is known and number of revolutions is given and the size of shaft is wanted, proceed as follows: What diameter of shaft is required as a prime mover to transmit 75 H. P. at 175 revolutions? $75 \times 100 = 7500 \div 175 = 42.86 \div 2 = 21.43$. The cube root of 21.43 is 2.75, (2.7776) the diameter required.

The same problem with the shaft used as a second line, would be: $75 \times 100 = 7500 \div 175 = 42.86 \div 3 = 14.28$. The cube root of 14.28 is 2.42 (2.4261) the diameter required.

Having got the size we want, the next thing is to get it put up, and it is right here where many failures and mistakes are made. There is perhaps no part of the plan which should be more carefully looked after than the proper lining of the shafting because it is a never-ending source of annoyance if out of line. The rules governing the putting up of shafting are few and very simple:

1st, Be sure that your shaft is exactly at right angles with the engine pulley; 2nd, see that it is dead level; and 3rd, be sure that it is as straight as a line can make it. The same rules should



be observed with intermediate and counter-shafts, they must be parallel with main shaft. All shafts carrying pulleys must be level; a shaft driven with gear from a horizontal shaft must be at right angles with it but may be run at any angle from the horizontal, and the same if driven from a perpendicular—in this case the driven shaft must be level, but may be run in any direction. If the building is likely to settle the adjustable hanger should be used, but where there is no danger of settling, stationary bearings should be used, especially for dynamos and all heavy machinery which ought to be as rigid as possible.

I do not think it advisable to give any rule for the distance at which bearings should be set, as circumstances vary in almost every case, but would state that for a 3" shaft the distance should never be more than 15 feet, and for a 2" shaft not more than 11 or 12 feet. These distances in both cases are for shafts without pulleys.

We have stated that second and third lines of shafting may be smaller than the first, but this applies only where they run at the same or at higher speed, and does not apply where the speed is reduced for the purpose of driving heavy and slow speed machinery or lifting heavy weights. Let us try to make it plain. Let us assume we have a weight of 33,000 lbs. to lift and a one H. P. engine to lift it with; we can raise the weight one foot high in one minute, but if our weight is ten times as heavy, or 330,000 lbs., it is evident that to lift this with the same engine it can only be done by a sacrifice of time, or in other words a reduction of speed (bear in mind that to lift a weight greater than the motive power can only be done at a sacrifice of time). Now what are we going to do? Our weight is 330,000 lbs., and our engine is only 1-roth the power required to lift it. It is evident we must construct a system of reducing gear. We will assume that we require three reductions—the first reduction will be from the engine to the first shaft, and so on until we reach the third or last shaft which supports the weight. Now the nearer we get to the weight the stronger must the shafting be, and the same with the gear, because as each shaft is reduced in speed it is capable of transmitting less power, and therefore must be increased in size.

Precisely the same principle is clearly shown in the use of the lever—a man can lift a heavy weight with a lever, but it is always at a sacrifice of time or speed. It is also well understood that the end of the lever on which the man rests may be very much smaller than the end which rests on the fulcrum, because on it rests the whole weight.

LET NOTHING BE WASTED.

THE age in which we live is characterized by its utilization of what has been known as waste material. Debris and refuse are being reclaimed from their supposed worthlessness, while wealth and comfort, says the Age of Steel, are now deduced from what has hitherto been without commercial value or public service. With epoch-making discoveries we are tolerably familiar, their magnitude giving them dramatic interest, and their coincidence with our own time table of life adding not a little to our conceit and boasting. While our progress, however, is a fact, and our bigheadedness a misfortune, the smaller economies of the age are of the unobserved, yet the veritable potentials of our prosperity. Everything has specific value, be it great or small, the difference being in gradation but not in essentials. The pebble is but the microcosm of the rock, and the molehill of the mountain, the difference being one of magnitude but not of substance. In the matter of our industrial waste or refuse this law has generally been neglected till science exposed the folly of waste and the stress of industrial competition compelled its utilization. Necessity has always been the mother of economies, and in this instance when the margins of profits were attenuating into consumptive decimals, applied science came to the rescue and gave commercial value to what had hitherto been a nuisance. Examples are numerous, and by way of emphasis we collate a few of the most conspicuous.

For many years the slag from iron furnaces was but useless refuse. It was dumped on waste land, in convenient ravines, and in unsightly masses wherever possible. It is now manufactured into asbestos, cement, glassware, pottery, fire-brick, fertilizers, and into the paint which now embellishes the Pullman palace car. Sawdust, so long the nuisance of saw mills, once dumped into swamps and pits, can now be made into sheeting for buildings, and when mixed with paper pulp supplies an excellent article. It is also serviceable in making aniline dyes, wood alcohol and certain acids. Cotton seed, once left to rot at the cotton gin and used for fuel, now furnishes the oil, lint, food for cattle and fertilizers; the product of the oil industry amounting to \$16,000,000 per annum, with the sale of lint and hulls realizing over \$1,500,000 each in the same period. The refuse of silk factories or warehouses, once a nauseating and uncleanly compound of leaves, imperfect cocoons and dead worms is now utilized, being sorted by machinery, and the short threads incorporated in valuable commercial fabrics. Coal tar was once but an olfactory nuisance, and sometimes got rid of by burning it under gas retorts, now aniline dyes are obtained from the benzole it contains. Other by-products of coal, such as sulphate of ammonia, etc., are now sources of industry and wealth. The refuse of woolen mills, once a sanitary sinner in the pollution of creeks and rivers has come in the range of chemical science, while in many large chemical works the saving of gases, since a menace to public health, have by condensation been transferred into valuable commercial articles.

Other examples might be quoted, but the catalogue as so far given is ample evidence of the fact that these modern economies of waste play no insignificant part in the general make-up of our industrial products and prosperity.

POWER OF MILL STREAMS AND FLUMES.

THE following table shows the number of pounds of water that will pass through an orifice an inch square under various heads from one to ten feet; also the foot pounds of work there are in those quantities of water, the net foot pounds per minute utilized by a wheel with a rating of 80 per cent., and the horse-power developed by the wheel:

Head feet	Cubic feet per minute (actual)	Lbs. per min. (62½ lbs. = 1 cubic foot)	Foot lbs. per minute (gross.)	Net foot lbs. per min. (80 per cent. realized)	Horse-power (80 per cent. duty.)
1	2.1376	133.2437	133.2437	106.592	.0034120
2	3.0272	188.6955	377.2910	301.913	.009149
3	3.6992	230.5835	691.7505	553.400	.016770
4	4.2752	266.2935	1065.1740	852.139	.025822
5	4.7808	298.0032	1450.0160	1160.013	.035152
6	5.2352	326.3275	1957.9650	1566.372	.047466
7	5.6576	352.5671	2468.5997	1974.880	.059845
8	6.0480	376.992	3015.936	2412.749	.073114
9	6.428	399.7312	3597.588	2878.065	.087214
10	6.7648	421.6725	4216.725	3373.380	.102252

* Paper read before Toronto No. 1, C. A. S. E. by Geo. Gilchrist.

FLOUR MILLING OBSERVATIONS.

By R. JAMES ABERNATHY, IN "TRADESMAN."

THERE seems to be a delusion in the minds of some millers, a great many, in fact, in the past, that coarse cloth makes strong flour. It has perhaps arisen from the fact that strong wheat or wheat that makes strong flour grinds coarsely and can be bolted fairly clear through comparatively coarse cloth. But unfortunately none of the strength of the flour is due to the coarseness of the cloth; it is inherent in the wheat.

If wheat does not possess strength, the use of cloth, neither coarse nor fine, can add anything to it. Strong wheat will make strong flour no matter whether ground coarse or fine; but naturally strong wheat makes coarse flour, and in fact it is a somewhat difficult matter to make very fine flour out of it. Bolting flour through coarse cloth does not therefore add to the strength of it, and if it be soft flour is very liable to injure it by leaving it specky. In fact, it is almost sure to do it.

Wheat that grinds low, soft and fine must be bolted on fine or comparatively fine cloth, in order to insure good work. If the cloth is too coarse the flour will be not only specky, but off in color, both of which will condemn it when submitted to the practised eye of the inspector or the customary purchaser of flour.

It will therefore be seen that coarse cloth does not add to the strength, but does detract from color and condition, and hence coarse cloth should not be used except for bolting flour that grinds coarse.

There is no advantage in using cloth too coarse for the material to be bolted; this we have pointed out in a very conclusive manner, and will now say that the mill should be clothed on the start to suit the kind of wheat to be milled and the nature of grinding to be done, and while there may be some after experimenting in order to get the full line of cloth just right, after it is right then it should be kept about in that way and the grinding done accordingly. When the cloth has been put in perfect time and tone then must the miller be governed by it, because if he grinds too high the cloth will not be able to take care of the entire product and some of it will be wasted in tailings and feed, and again, if he grinds too low and too fine the cloth will bolt too freely and be dark and specky.

Cloth can be used only for bolting and separating, and not for giving merit to flour that it does not possess naturally. All mills should be carefully clothed in accordance with the work required of the cloth, and then the cloth should be furnished for the kind of work it was designed to do by the clever manipulation of the miller, who should always understand exactly how to do it.

ROLL SURFACE FOR MIDLINGS.

Much has in the past been said and written about roll surfaces for doing certain kinds and amounts of work. But, as a rule, if there be any deficiency or drawbacks in surface it will be found on the smooth roll side. Corrugated surfaces can be crowded and still do good work, but smooth surfaces cannot be. We do not advise crowding either, because it ought not to be done, but it is asserted unhesitatingly that smooth surfaces cannot be crowded.

If the first pair of smooth rolls has too much to do some will pass through unfinished, and tail over the various processes of bolting and separating and find its way to the next pair of rolls, which, having already been furnished with sufficient feed, find themselves overworked and unable to reduce all the feed that is furnished and are obliged to let a portion of it escape underground, which in time finds its way to the next pair, and so on to the end, when at last the unground product finds its way to the feed pile and is thus lost.

Each pair of rolls or series of pairs allotted to a certain kind of work should have ample surface to do their portion of the work well without missing any of it. If that is looked carefully after there will be no waste of unground material at the tail end, but all will be well finished.

As an idea as to about what is required, we will say that never less than two pairs of smooth rolls should follow one pair of corrugated in what is called the one-break system, and if high grinding is practised there should be three pairs of smooth rolls to take care of three divisions of the middlings stock. The length of the smooth rolls will depend on the relative quantity that each have to handle.

When making two breaks on wheat, using for the purpose two pairs of rolls, then there must be four pairs on the middlings stock in order to make a low finish. Now it must be remembered that in neither one of the systems here mentioned is it the intention to make middlings. Middlings in both cases are a result not of design, but of necessity, because however much we may desire to make no middling we cannot avoid so doing, and we use the smooth rolls as a necessity. If, then, we have to provide so much smooth roll surface in cases where middling making is not the intention, it certainly requires more in proportion in systems where middling making is the intention; and such is really the fact. All mills having three, four and more breaks on the wheat should be supplied with smooth roll surface in still more ample proportions.

The rule by which to be guided in all cases is to have the tail end of the mill a thorough finish, and if not so at the start smooth rolls should be added until it is so.

MILL OWNERS MUST KEEP INFORMED.

We cannot advise mill owners to unhesitatingly take hold of every new device, process or system that may be offered them with glowing promises of great reward, because "all is not gold that glitters," nor is every new machine, device or process all, as a rule, that is claimed for it by the over zealous owners or venders.

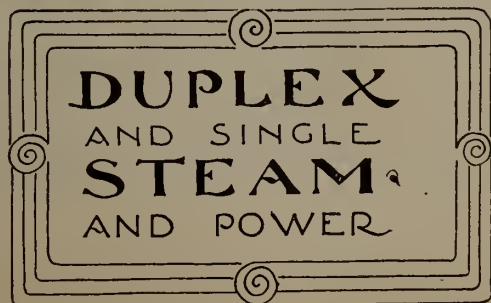
As a rule, the patentees and venders of new devices are honest enough; they have faith in their creations and believe them to be all they represent them, but their judgment is necessarily not infallible; it must be more or less biased and cannot therefore be accepted by millers as conclusive. Mill owners and millers must study the nature and principle upon which all new designs for the flour mill are based and if sound in these respects then a more thorough investigation will be in order, and all new appliances of whatever kind that have the appearance of merit on natural lines should be fairly investigated by every mill owner, with the view of keeping his mill squarely up with the times. The most modern mill must be continually undergoing changes, being evolutionized, as it were, in order to keep pace with the rapid march of progress.

Although there may be some men engaged in the field of new discoveries in flour making appliances who have no thought other than to make money of the millers without fair compensation, it is nevertheless true that many of the best men in the business are also engaged in the honest work of perfecting flour mill machinery and methods, and these men should be encouraged by the millers, such of them, at least, as need improvements in their mills, and most of them still do. Very recently must the mill have been built that cannot be improved upon. Therefore when the old and reliable houses and men that have been long in the business and well known to the trade, evolve anything for the mill that appears to be new and intended for the benefit of the flour making interest that promises easily recognized natural features, examine its merits at once and if found to be what is claimed for it accept it at once and put it to work if there is need for it in the mill. Having no room should cut no figure; if needful make room. A flour mill is like an old stage coach in which there is always room for one more, or for something else if it be needed.

The simple fact of the case is that no man can as yet have built for him the most perfect modern mill that can be designed and expect it to be run forever without change; the art is not perfect enough yet and may never be. All must watch for improvements that are improvements and benefit by them in order to hold their trade intact, otherwise, other more progressive men will steal it away from them.

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DOUGHING FLOUR.

At least once a day every miller should make a critical examination of his flour to see that it is running even, and if there is much variation in stock it should be examined oftener than once a day.

The majority of millers depend on examination of the dry flour under the slick, and it may be that in most cases that will do, as exact evenness and nicety may not be required.

It will be found much better, though, for all millers to make a practice of doughing their flour at least once a day, for in that way only can the color be brought out in full, and in no other way can the strength be so well tested as by doughing, or baking, which is a still more infallible test of strength.

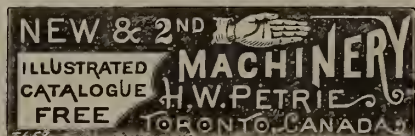
There are a great many varieties of wheat of which flour is made; some of them make dark colored flour white others very white, and sometimes the dark colored flour makes white bread, while the whiter flour sometimes makes dark bread. If the dark bread is common with the white flour, it is due to chemical combination of that kind in the wheat, but if not common it may be owing to chemical changes that take place during the process of fermentation and baking. Careless, indifferent or ignorant domestic bakers often bring the very best of flour into disrepute by baking it. For that reason the baking test should not be resorted to except by skillful bakers, while the doughing and drying test is a natural operation that brings out nothing but natural results.

It requires some skill and alertness to properly dough. In the first place the hands should be washed perfectly clean; with the left hand grasp a small handful of flour, and with the hand held about half open make a cavity in the flour with the finger of the right hand, and into the cavity drop a small tablespoonful of water. Then with a small mixing stick prepared for the purpose mix flour—and water—well without slopping it over. A good flour dougher allows no slopping. After it has been mixed to a proper consistency with the stick, grasp it quickly in the finger of the right hand and begin with the finger of both hands to knead it rapidly. If the proper consistency was obtained and the fingers kept in quick motion there will be no sticking to the fingers, but if not there will at once be a tendency to stick to the fingers, and if so the dough should be rolled in the flour a time or two, or until proper

consistency is reached. The dough must then be kneaded until it becomes very elastic so that it can be drawn out in very thin sheets. It can then be allowed to dry and the color will be brought out to perfection and the strength well tested. If the dough is at first made too stiff try it over again.



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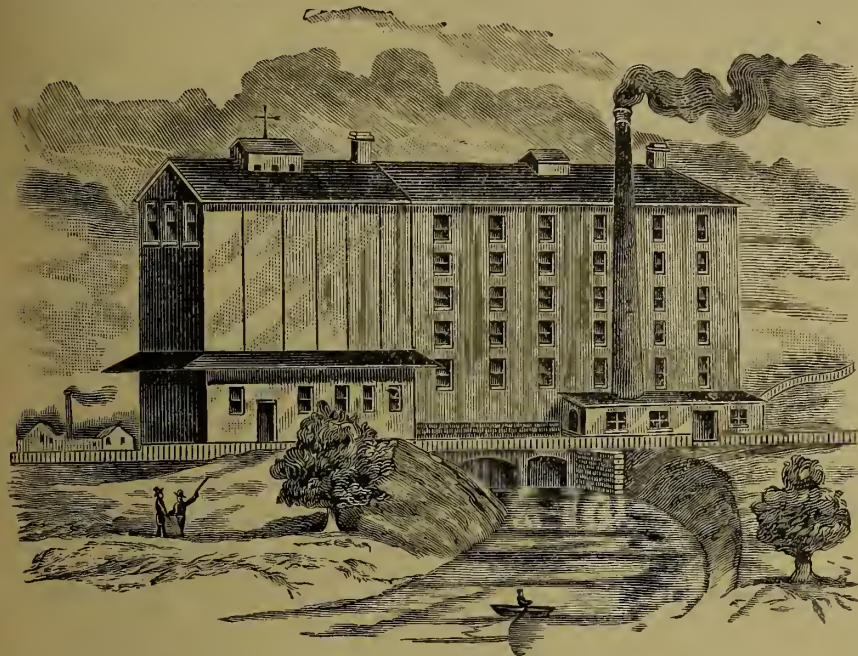
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NEW SERIES "MECHANICAL AND MILLING NEWS"

OLD SERIES, VOL. XI. }
NEW SERIES, VOL. IV. } NUMBER 7

TORONTO, ONT., JULY, 1894

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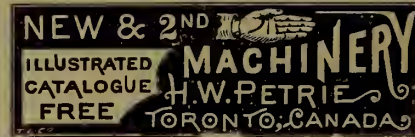
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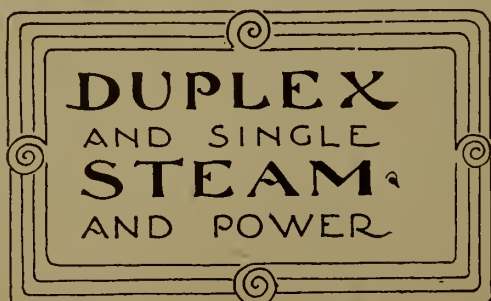


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THE CANADIAN MILLER

OLD SERIES, VOL. XI. } NUMBER 7.
NEW SERIES, VOL. IV. }

TORONTO, ONT., JULY, 1894

{ TERMS, 1.00 PER YEAR
{ SINGLE COPIES, 10 CENTS

REDUCTION FLOUR MILLING.

By R. JAMES ABERNETHY.

MANY years ago it now seems, when roller milling was in its infancy, an effort was made to establish a short method of reduction flour milling on the three break basis by some that possessed the least knowledge of the business, but as the idea was not supported and encouraged by those having the most influence in the matter of developing flour making processes it was practically abandoned, and thereafter all effort took the one direction of lengthening and elaborating.

It does not now appear that the cause of failure was so much due to the use of only three breaks as in not knowing how to make the proper divisions of the material, after the breaking had been done, in order to secure a complete finish and avoid waste by allowing partly reduced flour making material to pass entirely through the mill and land in the feed bins at the tail end of it.

It was this waste of stock that caused the three break idea to be abandoned; so much was wasted in that way that no profits could be earned, although profits were much larger then than now.

There were some that put in pony burr mills to finish the waste material with, but the results were not generally satisfactory, and the whole scheme had to be given up, more for the want of talent and inclination to develop it than for any other reason. This is conclusively proven by the fact that since then the three break system had been brought to a high state of perfection and is now in very common use.

Attention was a second time called to the three break system a few years ago, when the short system idea was sprung upon the fraternity, and so vigorously contended for by the writer and others.

Foreseeing that a further lengthening of the then very elaborate gradual reduction system would be out of the question and that shorter methods must surely follow, flour milling engineers came down from their lofty perches and began in genuine earnest to consider ways and means for shortening rather than for lengthening the already very long methods.

Those who had been so long accustomed to middlings making by the gradual reduction process were for the most part quite unwilling to abandon it and come down to direct flour making, as was being advocated by the short system people, and so turned their attention to the rehabilitating of the defunct three break system with the view of having both a short and at the same time a middlings making system.

When we speak of a middlings making system especial reference is had to patent flour making which had for many years been the rage among millers everywhere, and as they could not at once abandon patent flour making, neither could they give up middlings making, as they thought, because of middlings patent flour had

to be made. That, however, is true in part only, and depends somewhat on the locality and the kind of wheat used.

But, anyway, the three break system was again taken up by those possessing both the skill and the knowledge needed for its further development, and it now exists in a very perfect state, and can be safely adopted by all desiring no shorter method.

The writer does not believe that any middlings making or patent flour making system is really needed, as such anywhere, no matter what the conditions are, but as there are so many that do think so he is quite willing to accept the three break method as legal and a long stride in the direction of simplicity.

The miller that believes in making patent flour—and it may just as well be admitted that until a decided change in sentiment takes place patent flour must be

the hard wheat to flour in any very large proportion. Hard wheat is inclined to break into particles instead of being reduced to flour, and hence it is probably better to accommodate it by the use of three breaks with smooth corrugations. With the smooth corrugations the flour that is made direct should be white, when separated from the impurities, and when mingled with the middlings flour, ought to make, and will make, if the balance of the mill is arranged right, a high grade of flour. No short system mill from three breaks down to one should be arranged in a manner that will injure the break flour, as in the case of long system mills, because if so the object is already half defeated. The intention of short system milling is to preserve the break flour even though patent flour be the highest aim.

There is another method embodying three breaks that has for its chief object a thorough cleaning of the bran.

The results of such a system are much the same as in a two break system. The work of the first pair of rolls is a little higher than the first in the two break system, and the work of the second pair a little higher than the second in two break system, but the third pair get right down to the bran and the flour is fit for low grade only.

This method does not make

so many middlings as the other, and is more nearly akin to the regular two break method than to the regular three break.

SETTLEMENT OF BUSINESS DISPUTES BY ARBITRATION.

In Winnipeg, says the Commercial, we have a system of arbitration established and carried out by a business organization, and the result is a hundred times more satisfactory than it would be if the law were called in to settle such disputes. We refer to the arbitration board in connection with the grain exchange. The system of arbitration established by the grain exchange is of course only by agreement of the members. It has no legal power nor force, and there are no means of enforcing decisions beyond the rules of the exchange. We believe there is room for a legally qualified board of arbitration in Winnipeg, before which business men could take their disputes for final settlement. Such an institution should be able to accomplish much good work, in the direction of settling trouble among business men and saving expense, as well as saving friendship. Arbitration is usually adopted in a friendly spirit, but who ever heard of the law being invoked in a friendly way.

A prominent merchant of Memphis, Ohio, is offering a reward of \$1000 in gold to the person who will invent a package or barrel weighing one pound and carrying 196 pounds of flour or meal. With such a barrel there will be an end of sealage.



KINGSTON, JAMAICA. KING STREET OVERLOOKING HARBOR. (See pages 4 and 5.)

made—can with propriety and safety adopt the three-break system, because as compared with the gradual reduction system the cost is light enough to enable any miller with moderate means to put up a mill and proceed to business.

When arranged to make middlings in a modified form, that is, in not being an extreme in that direction, a three break mill can be used for making a very fine straight, in substantially the same manner as the two break system already referred to. If the breaking corrugators are not too sharp the break flour made in a three break mill may be brought up to a fairly high state of perfection in color and an excellent product result from the blending of the break and middlings flour.

If such mills are so arranged they can be worked both ways to advantage, and when demand requires a strictly middlings or patent flour it can be made, and, on the other hand, if a straight or 80 to 90 per cent. of the whole product of a very high order be required that also can be made.

In operating a mill of that kind a miller must be guided by conditions and circumstances, as in fact he would be in any other position. A three break mill properly arranged will make either straight or patent, as patent is usually made, and the miller can accommodate both himself and his customers, and be in a position to make money, if any money is to be made in the business. We might also call attention to the fact that where hard wheat is to be ground exclusively or even very largely, the three break system may be the best, all things considered; because of the difficulty in directly reducing

THE WEST INDIES.

CANADIAN FLOUR TRADE WITH THE ISLANDS.—CONSUMPTION OF FLOUR.—POSSIBILITIES OF DEVELOPMENT.—AN INTERESTING TRADE CHAPTER.

WERE this the proper place it would be an interesting and pleasant task to present our readers with a letter-press description of the West India Islands; to tell of their charm of climate; the story of their rich resources in toothsome fruits; and the many delights, especially to those who live in a more frigid zone, of this beautiful tropical country. But this is not the purpose of the MILLER just now.

No one is likely to take more interest in these things than members of the milling fraternity. These islands, however, have another attraction to Canadian millers, and that is in the field they open out for the consumption of Canadian mill products. In Jamaica, with its population of 650,000, Barbadoes, the Bermudas, British Guiana, Martinique and the other West India Islands, there is undoubtedly a large field for Canadian flours, and the question that interests millers just now is how they may secure, at least, a fair share of the flour trade of those islands. The official figures tell us that the value of wheat and wheat flour exported by the United States to British Guiana and the West India Islands averages about \$7,000,000 a year. From an inquiry made by the Executive of the Dominion Millers' Association a year ago, it is learned that a total of 529,800 bbls. of flour are imported by the West Indies yearly.

This is a trade worth securing and the purpose of the present chapter is to throw some light on the subject.

ENCOURAGEMENTS AND DIFFICULTIES.

THESE are very fully treated in an interview further along in this chapter with Mr. Adam Brown, who, during his visit to Jamaica, representing Canada as honorary commissioner at the exhibition of 1891, did yeoman service in furthering the interests of Canadian flour on the islands. The interview ought certainly to be read by every miller. Mr. Brown tells, as he has done before in his official report, that the trade in flour with the West Indies is ours, if we go about getting it in the right manner. This view has been confirmed by a letter from Hon. Geo. E. Foster, written to the Millers' Association in 1891. Both Mr. Brown and Mr. Foster place every emphasis on the necessity of sending to the Indies only a flour that can be guaranteed for a period of at least two months. There is good reason to believe that Canada's opportunities for flour trade with these islands have been injured through flour of an inferior quality having been sent there.

INTERVIEW WITH MR. ADAM BROWN.

HOW CANADIAN MILLERS MAY SECURE AND HOLD THE WEST INDIAN FLOUR TRADE.

WITH the view of securing additional information, concerning the West India trade in Canadian flour a representative of the CANADIAN MILLER paid a visit to Mr. Adam Brown, postmaster at Hamilton, and honorary commissioner to the Jamaica exhibition for Canada in 1891. As with everyone who has had occasion to meet Mr. Brown, either in his official or private capacity, the writer found him most approachable, genial, and ready to impart whatever information was in his power.

"Of course your particular interest," said the ex-commissioner, "is in Canadian flour and let me say how glad I am to find you are paying attention to this question. What you had to say in the last issue of the MILLER ought to prove food for thought with every miller who has an ambition to see his trade develop outside of mere local boundaries.

"My interest in the trade of the West Indies dates back to the days when I was a young man, a clerk with Gillespie, Moffatt & Co., of Montreal. That is more than twenty-five years ago, and at that time a large trade was done with the Indies in Canadian products, flour included. Those were the days of sailing vessels, and placed in even competition with the United States, as regards carrying facilities, there was no trouble in Canadians holding a large share of the trade with those islands. But conditions change. Steam took the place of canvas, and for a score of years, up to the time of the Jamaica exhibition in 1891, our business with the Indies became almost a blank. This circumstance of itself is an answer to the question sometimes asked, 'How has the United States succeeded in securing such a strong grip on West India trade?'

OPENING TRADE WITH THE INDIES.

"Having received my appointment from the Dominion government to represent Canada at Jamaica, I lost no time in ascertaining what products were most required in the Indies. Flour occupied a foremost place in the list. To interest Canadian millers I addressed a convention of Ontario millers a few months before leaving for the tropics. I laid before the meeting what seemed to me the plan needful to secure the flour trade of the Indies. I will be frank in saying that I received but scant encouragement from these gentlemen as a body. They did not seem to grasp the situation, and to realize the volume of trade that was theirs, if they wanted it. About

have followed the suggestions born of my experience and experiments when in the Indies, their flours have never failed to give the fullest satisfaction. I notice that in last month's MILLER you publish results of an analysis of flours made in Georgetown, Demerara, which gives the St. Lawrence, a United States brand, the place of honor over our flours. I am not so sure that the test in question is a fair one. The Americans do not like the possibility of Canadians capturing the flour trade that they have held for so many years, and various efforts are adopted to create a prejudice against Canadian flours. This may be one of those peculiar moves. This I do know, that in Jamaica we met the St. Lawrence brand and downed it with Canadian flour every time. Flour made from Manitoba hard wheat will stand every test that these tropical climates call for. Wherever Canadian flours have proved disappointing, it has been because our millers have shipped in an inferior quality of flour." Here Mr. Brown instanced two cases in particular that had come under his notice, where a poor flour had been shipped to the Indies and our trade suffered seriously as a result.

METHODS OF SHIPPING.

"Complaint has been made in the past," I remarked, "of the character of our packages." "Yes," replied Mr. Brown, "it is folly to make shipments to the Indies except in barrels with round hickory hoops. Our millers were disposed to treat this as a trifling matter, and were slow to adopt the round hoop barrel, and thereby lost trade. Aside from the foolishness of butting against the customs of the country, the round hoop means money to the West India flour handler. After the barrels are empty they can be sold for 1s. 3d. and 1s. 6d., for packing oranges, pine apples and other fruits. This figure comes into the calculation of the flour handler in estimating the price paid for his flour. Flat hoop barrels are worth nothing."

IMPROVED CARRYING FACILITIES REQUIRED.

"I have mentioned," continued Mr. Brown, in answer to a suggestive inquiry, "how well

Canada fared in West India trade when we were on a par in carrying facilities. We are suffering some to-day for want of quicker vessel service between Halifax and the West Indies. We are told that we have a fortnightly service, and in one sense this is correct. Vessels of the Pickford & Black line leave Halifax or St. John twice a month, but they go to different groups of islands. The service is only once a month to each section of the islands. If a miller is shipping to Demerara, for example, and his supplies are a few days late in reaching Halifax, the goods must be held until the next monthly boat leaves. With a regular weekly service from New York our exporters are necessarily handicapped, depending on the Canadian line. Merchants in the islands would tell me they could order flour through New York with the certainty of receiving it promptly almost to the day. This could not be done ordering from Canadian millers. Their flour is shipped chiefly with draft attached to bill of lading, payable at sight. I have known the draft to be presented by bank, before the flour had actually left Halifax. Merchants do not relish doing business in this manner, and this circumstance has operated against a greater expansion of Canadian flour trade with the Indies. It would be helpful to Canadian trade in all its interests if Canada would become an importer of the natural products of the West Indies. It really seems too bad that with a sister colony within comparatively easy reach of ourselves, that the rich resources in the line of fruits grown there come to us by way of a foreign country. A development of trade that would permit of frequent return cargoes from the Indies would materially



MONTEGO BAY, JAMAICA.

the same time I communicated with a number of the leading milling firms of the country and interested them to the extent of making shipments of flour to the exhibition. The millers who made exhibits at that time were: W. W. Ogilvie and Ira Gould & Sons, of Montreal; Lake of the Woods Milling Co., Keewatin; Todd Milling Company, Galt; James Goldie, Guelph; Whitelaw & Baird, Paris, and Walker, Harper & Co., Norwich.

DRY FLOUR AN ABSOLUTE NECESSITY.

"The Hon. Mr. Foster said to me, 'If you can be sure of the flour you take to the Islands holding sweet for not less than 60 days, then success is made.' This purpose I kept steadily in view at the start, and was able to prove before the exhibition was over that Canadian flour would not only keep sweet for 60 days, but I was able to make a distribution of bread made from Canadian flour that had been in store in Jamaica for four months, and everyone was ready to declare that sweeter or better bread had never been eaten in Jamaica. Flour sent from Canada must be made of perfectly dry wheat—Manitoba No. 1 hard—and when this is done, United States competition need not be feared."

I asked Mr. Brown: "How it was then, when we certainly had the wheat to make the particular brand of flour necessary to this tropical climate, that Canadian flours were being criticised as holding only a second, third or fourth place among the flours imported into the Indies?"

"Let me be very clear on this point," said Mr. Brown, with some emphasis. "Wherever Canadian millers

strengthen trade, and the flour trade, of course, would feel the benefit. Vipond & Co., of Montreal, are doing something in this line, but we want a good deal more done.

"During my stay in Jamaica I talked constantly from the text, 'Blood is thicker than water,' and I tell you it has had, and can be made to have, a large influence in directing West India trade to Canada. It is more than a mere sentiment to say that, 'Trade follows the flag.'"

THE SUM OF THE WHOLE MATTER.

"In connection with this whole affair I cannot conclude better," said Mr. Brown, "than in a word to say that with quality of flour kept up to the standard that was established when I was in Jamaica; all stocks sent in round hoop barrels; prices, as can easily be done, made to rule as favorable as those of the United States; and with shipping facilities strengthened, we can control the West India trade. I speak knowingly, when I put the matter so plainly. Added to this an effort ought to be made by Canadians, or their representatives, to visit the Indies, say twice a year, and thus keep themselves in touch with the people there. No better class of business men are to be found anywhere than in the leading islands of the Indies, and it only needs the relationship, both natural and business, to be cultivated rather more than at present to substantially increase our trade."

"Now good-bye," said Mr. Brown, "if I can do anything further at any time to advance Canadian trade command me."

WHAT SOME CANADIAN MILLERS SAY.

WE are in receipt of a number of letters from millers in different parts

of the country, regarding what was said in last month's CANADIAN MILLER on the question of our flours in the Indies. Mr. Robt. Noble, of Norval, Ont., who has shipped more or less flour to the Indies, and whose son paid a visit there about a year ago, expresses his pleasure at the interest the CANADIAN MILLER is showing in West India flour trade, and makes the significant remark, "I hope you will be the means of creating more interest among Canadian millers." We have reason to believe that millers themselves, as Mr. Noble's remark suggests, have not shown the interest in this matter that, from a personal point of

view, one would expect them to show. Messrs. Clark & Son, of Glencoe, who claim to be the pioneers in West India flour trade, are disposed to view our articles and letters of last month from a variously critical and favorable point of view. They tell us that, "A portion of our comments is far from the mark, whilst other points bearing largely upon the developments of our flour trade in the West Indies must be corrected right at our very doors. There is want of proper system in the buying and handling of wheat." Unfortunately the proprietors of the Aberdeen mill are not over explicit as to what "points" call for correction and improvement. The Messrs. Clark, like Mr. Brown, in his interview, have a suspicion that the Georgetown analysis of flours, placing the St. Lawrence (a United States brand) at the head of the list, may not be an impartial document. They would like to see an analysis made by a government analyst at Ottawa. This is a suggestion that might be taken into consideration by the government. They facetiously conclude their letter by saying: "We have seen exhaustive reports of Canadian flours that would cause a Canadian cow to laugh." Mr. T. O. Kemp, the clever manager of the Ogilvie mills at Seaford, believes that our flours are highly appreciated by

West India consumers, as compared with American flours. He says: "I have no doubt Canada would do a good business in the Indies under such conditions as I think could be easily established were they more in sympathy with one another. The greatest obstruction I find to doing a trade there is the inconvenience of connection and having to work too much in the dark on this account." This is a view of the case that gives strength to the suggestion mentioned elsewhere that Canadians should visit the Islands from time to time and get to know from personal contact the methods, manner, and character of the people they want to do business with.

The opinions quoted here will, perhaps, give the keynote to the thoughts that Canadian millers have on this question. What are the thoughts of others from whom we have not heard?

STEAMSHIP SUBSIDIES.

THE matter of steamship subsidies was introduced in the House of Commons a few days ago by Mr. Kaulbach. He asked that the system of subsidizing steamers



CANADIAN COURT, JAMAICA EXPOSITION.

to the West Indies be discontinued in the interests of the sailing vessels. His particular reference was to the line managed by Messrs. Pickford & Black. Mr. Campbell, the West Toronto Junction miller, though a member of the Opposition, spoke strongly against discontinuing the subsidies to the West India Island steamers. He said the result of the establishment of these lines had been to largely increase our trade with the West Indies in flour and other Canadian products. From what we have to say elsewhere in the West India chapter, it is plain that any movement of the government to lessen shipping facilities to the Indies would be suicidal, if we have any notion whatever of extending trade with these islands. In fact, the necessity is clear for action by the government, that will lead to an improved service with the Indies.

Extensive repairs are in progress to the upper portion of the big Ogilvie mill, Winnipeg.

A bonus is offered in aid of a flour mill at Wawanessa, Man. About a score of persons made enquiries as to the capacity of the mill required and the conditions attached to the bonus, but all of them drew back when they found out that a 150 barrel mill is required.

BELT TRANSMISSION FOR ELEVATORS.

THIS question is discussed by A. E. Baxter, in a late number of the Northwestern Miller. He says: There have probably been as radical changes in the mode of handling grain in large quantities during the last few years, as there has been in the manufacture of flour; and no modern grain warehouse handling grain in considerable quantities is constructed in the same manner as those of but a few years ago. The instore leg and spiral screw conveyor are things of the past in modern equipments. Perhaps the results of some experiments as to the efficiency of the screw conveyor and the belt for the horizontal transmission of grain may be of interest. These experiments were made to determine which line of machinery should be adopted in the equipment of Waterloo Dock granaries at Liverpool. These experiments were made some years ago, but the results then obtained are so nearly in accord with the best modern equipments of to-day, that they form a reliable basis to work upon. There is always great difficulty in arriving at actual results, as the equipment of no two plants is the same, and the different arrangement of machinery almost always leaves a factor of uncertainty to be accounted for. These experiments, however, were both made under the most favorable circumstances, and especially constructed to determine the efficiency of the two systems, and may be regarded as the most favorable results attainable by either system. The first experiment was with a 12-inch screw of 4-inch pitch and 1/4-inch clearance and running at 60 revolutions per minute, and the result was 225 bushels delivered per hour and a requirement of .04 hp per foot carried; and the sectional area of grain conveyed was 49 per cent of the transversed area of the screw. At a higher speed, the grain was carried around and not propelled. A 12-inch screw with 15-inch pitch was then tried at 70 revolutions—the most efficient speed in point of economy of power and quantity delivered—and 1,133 bushels per hour was delivered and .125 hp was consumed per foot traveled, or 37 per cent less than for the first screw for the same grain delivery. The sectional

area of grain carried, when in motion, was 72 per cent of the area of the screw. Another interesting feature was that the screw with the small pitch moved the grain in a compact body, while the coarser pitched screw caused it to roll and surge around, and put the grain in much better condition. These experiments clearly demonstrated the impracticability of adopting the screw for the handling of large volumes of grain. Experiments with belts showed that a speed of 480 feet per minute was the most efficient for handling grains of all kinds. Wheat, however, would easily stand a speed of 540 feet per minute. A 12-inch rubber belt, travelling at 480 feet, carried with ease 1,160 bushels per hour, and an 18-inch rubber belt, at the same speed, delivered 2,320 bushels per hour. The power consumed was .014 (or 1-70) hp per foot carried. This clearly demonstrated the superiority of belts for the transmission of grains under all ordinary conditions. Further experiment showed that the amount of power required by different devices to carry 1,666 bushels per hour a distance of 100 feet were: Common screw in stationary case, 18.38 hp; common tubular screw, 25 hp; 18-inch common rubber belt, 1.02 hp. These experiments the superior carrying capacity of belts and their greater efficiency in consumption of power.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

MILLERS' ANNUAL MEETING.

AT a meeting of the Executive of the Dominion Millers' Association held a few days after the last issue of the MILLER had gone to press, arrangements were put well under way for the holding of the annual meeting of the Dominion Millers' Association. There were present of the Executive: A. H. Baird, of Paris, president; H. Barrett, Port Hope, vice-president; C. B. Watts, Sec.; William Galbraith, treasurer; James Goldie, Guelph; J. D. Saunby, London; W. H. Meldrum, Peterboro; J. Galbraith, Allendale; M. McLaughlin and J. L. Spink, Toronto.

It was resolved that the annual meeting be held Tuesday, August 7th, with an afternoon and evening session. On the morning of the 8th millers and their friends will leave on the annual excursion to Niagara Falls. A committee was appointed to perfect details in connection with this outing, and were specially instructed to insure good arrangements for the annual dinner on the arrival of the party at the Falls. No doubt they will look carefully after that matter.

The programme prepared for the business session on Tuesday will include in addition to the reading and discussion of the reports of the several officers, which are sure to be exceedingly interesting, a number of special papers by leading millers. Mr. James Goldie will talk about chattel mortgages on farmers' grain. Mr. McLaughlin will have something to say about the export flour trade, its losses, and why? The question of fire hazards on flour mills will be led by Mr. J. L. Spink. Car shortages and how to remedy the trouble, will form an interesting subject of discussion, led by Mr. W. H. Meldrum. Our export trade and some of its requirements, is likely to form the subject of an address by Mr. N. H. Stevens, of Chatham. Mill furnishers will have their innings in a paper on the plansifter by Mr. Hodd, miller, of Stratford, and who is interested in the company manufacturing this machine. A lively discussion is anticipated here.

Messrs. Huston Bros., of Durham, were elected members of the association.

The annual meetings of the Dominion Millers' Association have never failed to be of an interesting and profitable character, and there is every reason to anticipate that the coming meeting will be one of the most important in the history of the organization.

TWO-PRICE FREIGHT RATES.

A CURIOUS state of affairs was evolved at the last meeting of the Executive of the Dominion Millers' Association. The question of freight rates was under discussion, and the information was imparted, that it was a difficult matter for a miller in the present day to say what the tariff was on flour. Cases were cited where certain quotations would be given by our railroads for particular shipments. Another miller from the same locality, who was a little better posted, would make application for a similar class of shipments and receive quotations several cents less than his neighbor. From what was said by individual members of the executive it would appear there is a tariff that is quoted a shipper, if he is willing to accept that as the rate. But let some one, who knows, state, that shipments having

been carried at a lower figure no better rate will be given, and the railroads will accept the situation. For the protection of members of the Dominion Millers' Association, the secretary was instructed to insert a note in the weekly bulletin, asking millers who desired to receive export rates for shipment, to first communicate with secretary Watts, in order that they might be fully protected in securing the best rates going. We are accustomed in the small ways of business to more or less dickering, but things have certainly taken a peculiar turn when our great railroad corporations have two, three, or more prices for carrying freight. No more vital question can be taken hold of by the Dominion Millers' Association, when they meet next month, than this one of freight rates. And millers would not only benefit themselves, but they will be fighting a battle of general interest to the entire commercial community of Canada, when they insist, to quote a familiar retailers' expression, on one price only.

NEWFOUNDLAND FLOUR CONDITIONS.

[Special correspondence CANADIAN MILLER.]

"The present outlook in Newfoundland," writes Taylor, Finlay & Co., of St. John's, "appears a puzzle. Imports of flours here to date are about 96,000 barrels, as against 110,000 barrels to same date 1893. This is owing to the general depression in trade, as well as the fact that on falling markets the people buy only what they absolutely need. The great bulk of our flour comes via Montreal by the "Black Diamond" and "Dobel Line Steamers," but it must not be concluded that this means that it is Canadian flours, though the importation of Canadian flours is certainly on the increase here and we should judge that we have four times as much Canadian arriving here now as we did four years ago. Before opening navigation with Montreal this year we received a large quantity of Canadian flour via New York, Boston and Portland. Oatmeal is almost entirely Canadian, except a little Scotch. Peas, oats, mill feed, hay and cheese all come from Canada, except some small quantity of the finer qualities of the latter, which are from Europe. Our duty on flour is 25c. per bbl., and we do not discriminate in favor of any country."

ST. JOHN'S, NEWFOUNDLAND, June 19th, 1894.

LOW PRICES A GAIN TO THE BRITISH MILLER.

By W. T. BATES IN ENGLISH "MILLER."

THE development of the wheat market during the past few years, and particularly within the past few months, leads everyone to ask his fellow the momentous question, "What is the market coming to?" Most people have for a long time been thinking that every fall is to register low water mark, but now that the bottom seems to be knocked entirely out of the market, all are anxiously wondering where it will all end. The bakers seem to be weary of low and constantly sinking prices, and many of them have given up in despair, having entirely lost faith in their speculative shrewdness, every apparent bargain having proved a burden, added to an already weighty load. If the bakers would only take a lesson from this experience, they would give up speculative buying entirely, for I feel certain that on the whole they will lose by it. Neither does the miller, as a rule, gain, as he has to cover at whatever price he may sell.

Millers are complaining of low prices; but why? I can understand farmers and the landed interest generally deploring low prices, as they are the producers of the raw material, but I fail, utterly, to see what the British miller has to complain about. We have for years, and I personally have optimistically, predicted the time when the enemy, our competitors over the water, would be delivered into our hands. Surely the time is at hand. The British farmers' misfortune may prove our opportunity. Years ago I tried to prove that India and Russia, in conjunction with other exporting countries, would enable us to overcome American competition. Argentina was then a dark horse, scarcely thought of; but the dark horse is now in evidence, and now or never is our chance of showing what we can do. There is no need to create a prejudice against our competitors; we must simply annihilate them with low prices. With good wheat, such as most River Plate is, and a plentiful supply of Russian, both several shillings a quarter below anything American, we are not only independent

of that country, but in a position to meet her in any foreign market in the world.

And this is my suggestion. Instead of pushing and squeezing each other for every little order in our own little country, would it not be better, and could we have a better opportunity to imitate other manufacturers and create a foreign trade in flour? It seems to me that South America, particularly Brazil, as well as China, Japan and other countries might prove remunerative fields for British made flour. Our cotton manufacturers are importers, like ourselves, and we see what their enterprise has done for the export trade of our country. Why cannot we imitate them? We hear of flour being shipped from north to south and south to north of our country, most of which trade is unprofitable, but why not ship this flour to a foreign country at once and meet a foreign competitor on his own ground?

If America is to successfully compete with us at home or abroad, one thing is certain, she must import some of our cheap wheat. She cannot, under existing economic conditions, grow wheat at the price, whatever experts may try to prove or interested persons to assert.

I noticed recently that a sample of River Plate wheat had been exhibited on one of the American markets and and well spoken of for its apparent flour making properties, and I thought at the time that it was with a view to its introduction into that country; but this conclusion may have been precipitate, as in a country so closely protected as America, "interests" have a commanding influence. If, however, she should become an importer of our cheap wheat, we might look out for stronger and continuous competition.

Low prices ought certainly to favour us in many other ways. There is no denying the fact that the consumption of bread is increasing in this country, and that we may attribute very largely to lower prices, for poor people can now buy two loaves for the same money that a few years ago sufficed to buy only one, and considering that numbers of people exist almost upon bread alone, we may conclude that they eat more, although they have only the same money to spend. Take, again, the price of offals. It seems ridiculous that bran, the husk of wheat, should sell for as much or more than the wheat itself, but such is the fact. Indeed, until the recent drop, a farmer would actually pay more for bran than he got for his wheat. With wheat at 40s. per quarter we have seen bran at about £3 10s. per ton, and during this winter we have had farmers' wheat at about 24s., while bran has been between £5 and £6 a ton. A strange anomaly! and yet some people say that low prices do not favor the miller. Why, the low price of wheat and the high price of offals has alone enabled us to hold our own.

Some millers have done badly even this year, and they one and all blame the constantly-falling prices; but ought this to be an excuse? Is not speculative bargain-hunting a better explanation? By cautious dealing and management a falling market should prove advantageous to the miller. At a time like this heavy stocks are a mistake; a parcel of flour sold this week may be worth 6d. a sack less next week, which is the buyer's loss. If the seller could just manage to keep his sales a little in advance of his purchases he would not be wrong at the end of such a year as we have just passed through.

One of the greatest evils of to-day affecting our trade is what I shall term the immorality of unprofitable competition. Some of us work for profit, and manage to make one, but it seems there are some who work for honour and glory. Competition is all very well, but how are you to compete with a man, or set of men, willing to lose 1s. on a sack of flour? In a late report by the directors of a certain mill, I read the old familiar tale of falling prices and consequent loss; but the report also states that they could sell more than they could make. I should think so! Fancy giving your customer 1s. with every sack of flour! It occurred to me that it would be better to do a small trade at a profit than a large one at a loss. Honour and glory do not pay in flour making.

There is no doubt that every mill has a legitimate profitable trade in its own locality. It may be small or otherwise, but in any case if content with that trade it could all be done at a profit; unfortunately, the miller

who can sell 500 or 1,000 sacks at a profit at home must enlarge his mill and make an extra quantity, which he cannot so dispose of. Consequently, he must push out and displace some miller at a distance, and generally without profit. That miller in turn must find a market for his displaced goods, and consequently, returns the compliment or goes into some other district with like result. This is how we find Liverpool flour in Cardiff and Cardiff flour in Liverpool, and every other town and village throughout the country imitating this example to their own loss. The large mills are, I consider, chiefly to blame for this state of affairs, and for cutting prices to an unprofitable level, particularly when they work at a loss.

Many people fall back on the old familiar cry of American competition. I do not deny that it would be in many ways to our advantage to import wheat and manufacture it ourselves; but there are compensations even to the miller in this competition, and many advantages to others connected in various ways with the trade. It is idle to imagine that this trade which is now done from America would greatly benefit millers, who now find a difficulty in making ends meet, except, perhaps, temporarily. We have only to point to America as an instance. They have no outside competition, but we know as a fact that American millers are far worse off than we are. Could we, as we now ought, entirely overcome American competition, we should each benefit temporarily. The milling engineers would reap a rich harvest, for well situated mills now making 25 sacks an hour would make 50, and those making 100 would as soon as possible double or treble their capacity. It would be a repetition on a small scale of the late milling revolution; probably all would make a profit for a time, but inevitably supply would overtake demand, and the large millers would obtain even a stronger grip than they now have upon the trade. Besides, think what the offals trade would come to. With a prospect of plenty grass offals drop 30s. per ton. If we made all the flour we might expect to see offals somewhere in just proportion to the price of wheat—about £2 a ton. This, I feel, would be a national advantage, but not a miller's. The farmer pays far too much for all his raw material. Cheaper bran and sharps might help him out of his difficulties, but in that respect alone do I look for very much benefit. I believe that at the present moment some millers are using American flour simply because they find their offals a drug, practically unsaleable.

If this is the state now, what shall it be in the future, when what we are taught to regard as a curse shall have disappeared.

Low prices! What is the cause? I know what our friends the bi-metallists would say—the demonetisation of silver. It seems to me that Sir W. Harcourt hit the nail on the head when he said that all the professors were bi-metallists, and all the business men mono-metallists. Especially do I believe this to be the truth, because we find the old protection theory almost dead, and the bi-metallic theory occupying its place, and advocated by the former champions of protection. Their doctrine is that the world is suffering from a scarcity of money; consequently the price of things is abnormally low. Certainly we have long been accustomed to higher prices, but those may have been abnormally high—inflated, in fact. We have been regarding 40s. per qr. as a normal price, but why not 20s.? Supply and demand determine prices, and if supply keeps above demand we may find that 20s. per qr. will be the normal standard, but of course other things must be brought into harmony therewith. At present, owing to the rapid decline in the value of cereals, land is decidedly too high. Land must meet wheat, and other values must also be brought into harmony with the new order of things, so that none suffer. But to return to the bi-metallic theory.

Everyone may not be aware that silver is not a legal tender above 40s. If I take a £5 note to the Bank of England it must be redeemed in gold, five sovereigns. In issuing notes the Bank is bound to keep a reserve of gold sufficient to meet any number of these notes. The reserve is usually about 40 per cent., but varies according to trade demands and the money market generally. At present money is a drug, and the Bank allows only 2 per cent., its reserve being over 60 per cent. When

trade is brisk and money is in demand the reserve sinks down, and just as it does the rate of interest goes up. This is done to attract gold from other countries, which it does, and this is the explanation for a fluctuating bank rate, which puzzles some people. Money, being a drug, seems rather to contradict the theory of those who assert that all our ills are the result of shortness of money. Although the production of gold has been enormously augmented by the recent developments in the Transvaal, there is no doubt whatever that were all transactions carried out in hard cash, we should not have 1 per cent. of the required gold, and to make up the deficiency in silver would entail a great hardship. Business is, and always must be, carried on by mutual credit and confidence. Paper represents money, and so long as money lies behind it, all is well. I, at least, fail to see in what manner silver would help the British farmer. If I had ten times as much money I should not give one penny more for wheat or bread, and I should pay just as much as if I had less. In the case of wheat it is not a question of money, but of buyers and sellers. If there were more buyers than sellers, the price would speedily go up, just the same as a preponderance of sellers has caused it to go down. I know the argument is that the gold premium helps other countries—Argentina, for instance; but the real truth is that the premium of over 300 per cent. on gold in Argentina is the surest proof of the rottenness of the financial situation. As the premium goes up the credit of the country goes down—in fact, the latter is the cause of the former. It is argued that with a high gold premium the farmer sells his wheat for, say 20s. per quarter for English gold. That 20s. immediately quadruples itself—that is, it represents about 20 dollars silver, or paper, instead of its normal value 5 dollars. This is all very well, but the fact is it is not the gold which has appreciated but the paper which has depreciated, and it will require those 20 dollars or more to purchase a sovereign's worth of goods. In other words, the farmer would be just as well off with his five dollars at its natural value as he is with his 20 dollars depreciated currency, for in both cases they stand for a sovereign and will pay for that value only. Of course it would be a very good thing if the Argentine farmer could get a gold sovereign for his wheat and then buy four sovereigns' worth of goods with it, but this is just what he cannot do, and for that reason is no better off, though more contented, than his British *confrere*.

I can understand silver producing countries wishing to monetise it, and also other countries, like those of the Latin Union, who have enormous quantities of depreciated silver on hand, wishing to form a bimetallic bond or union with England. It would doubtless be to their advantage, but not to ours. We are not suffering from a scarcity of bullion, neither is our credit impaired. Let silver find its natural level like wheat, and blame wheat for it if you like; but if we suffer little ills it is better for us to bear them manfully than to fly to greater, or to those which we do not understand.

I have gone astray from my subject, although the digression has some relation to it. I maintain that low prices are beneficial to the miller, but that a cut-throat competition, carried on at a loss, is injurious to all. It is, I suppose, useless to hope for any cessation. Low prices have certainly played into the hands of the millers situated at the ports, and from all appearances the future is with them. When English wheat was cheaper than foreign, inland millers did well; now the tables are turned, but let us hope not irretrievably.

SOME amusement has been caused by the settlement a few days ago in Toronto of an arbitration case. About two years ago a transaction in grain was made between J. B. McKay & Co. and J. Carruthers & Co. Owing to a shortage in weight, etc., the first named firm claimed \$550 from Carruthers. The latter, whenever approached by a representative of McKay & Co., always said he would allow \$28 for the damage done, but the McKays would not entertain such damage; they claimed \$550. The award is as follows: That James Carruthers & Co. pay J. B. McKay & Co. within three days from date of this award, the sum of \$28. The costs, amounting in all to \$14, to be paid by J. B. McKay & Co. The arbitrators were Messrs. J. L. Spink, J. H. G. Hagarty and William Galbraith.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

MONEY IN WHEAT

To the Editor of the CANADIAN MILLER:

Sir,—The man who talks about wheat reaching a price that will pay anyone for touching it, is apt, in the present state of the market, to be set down as insane. But I venture a prediction, all the same, that wheat is going to reach at least \$1.00 a bushel before long. It will be found, I believe, when the new crop commences to be marketed, that there is a scarcity of wheat that no one just now believes exists. India has all along been conceded, as a competitor in wheat, and yet the records of the past months show plainly how this country has dropped out as an exporter of wheat. We have had so many good crops that growers of wheat have been frightened off the field and things will take a turn when everyone will curtail the growth to that extent, that all round the crop will be found to come out at the short end. Stranger things have happened before. As the New York Journal of Finance has remarked, members of the Board of Trade have seen corn sell at 25c. a bushel, and a year afterwards at 80c. a bushel. A despatch from Duluth of the past month has said that there is good ground for the belief that there will not be wheat enough at the head lakes to supply the mills. Mark my words for it, wheat is going to touch a dollar a bushel.

Yours truly, A LOOK AHEAD.

FREIGHT RATES MUST COME DOWN.

To the Editor of the CANADIAN MILLER:

Sir,—It may seem like fighting the air to attempt a criticism of the contention made by President Van Horne that the rates for carrying freight to-day are as low as the present conditions of trade will permit. For one, I am not prepared to accept any such statement. Facts are contradicted by the various rates now reported by the railroads. There is simply no uniformity whatever in the rates of our two leading railways. It looks like a case of get all you can. When pressure is brought to bear upon the roads, concessions will be made, but the shipper who has not got the inside track will be charged a higher figure, though the very next day a neighbor may have received a quotation that would vary several cents. We have the same kind of thing shown in the difference made between rates from certain points in the west to some near point further east contrasted with the rate charged for freight, say from North Bay to an ocean point. From the railroad standpoint it seems to me it ought to pay the C. P. R. to reduce rates and thus encourage emigration to our Northwest.

Yours, etc., CANADIAN.

ARE MILLERS SLOW?

To the Editor of the CANADIAN MILLER:

Sir,—The necessity for hustling business in the present day ought to require no demonstration with any business man. We live in a day of the keenest competition, and where more than at any other time in the world's history the doctrine of the survival of the fittest prevails as an existing condition. I am commencing to come to the conclusion, however, that millers have not caught on to affairs, as they exist to-day. Rip Van Winkle like, it appears to me, they are sleeping. Perhaps a continued spell of dull times has had something to do with this lethargy, but this condition should point out the necessity for being more wide awake than ever. It may be said with a good deal of truth, whether we look at home or cast our eyes to export fields, that everything is so slow that push has no chance to make headway. If my observation, however, as a practical miller is worth anything, it teaches me that we might be further ahead in our export trade were we to show more interest in the question. You devoted a good deal of attention in your columns last month to the West India trade. I know something of that business and do not hesitate to say that the milling trade of Canada, as a whole, is showing altogether too great indifference on the question. If a foreign rival has captured the field the fault is ours. It is time we had, in the slang of the day, "got a move on."

Yours, etc., PUSH.



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The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

CAN GREAT BRITAIN EXPORT FLOUR?

It is commencing to be accepted as something more than a mere abstract opinion, that British millers are to-day developing a strong position as manufacturers of the better grades of flour. The evidence is clear that the mills of the Mother country are fully equipped for first-class work, and a first-class product is being produced. What developments in this direction may mean to the future of flour production on this side of the Atlantic remains to be seen. We look to Great Britain as an important export field for our flours, though for the past year it must be admitted that much good has not come of it. But what, if besides becoming an important manufacturer, thus closing what in the past has been a large field for our output, Britain should carry the war into Africa, and meet the Canadian beaver and the American eagle in their own nests, and become an exporter of flour?

This is a possibility that forms the subject of an interesting article from the English Miller, which we publish on another page, written by Mr. W. T. Bates, a well-known English miller and writer. The argument is that the British miller has advantages in securing good wheat at the lowest price. The thought takes hold of Mr. Bates with greater force because of the low prices at which the British miller is just now, at least, able to buy Argentine wheat. The contention then is that Britain might export flour to Brazil, and also to China and Japan, though in the case of the former point our contemporary fears that the British miller would meet a host of formidable foes from the United States, Hungary and Argentina, remembering at the same time that some well equipped merchant mills are to be found in Argentina.

Consolation ought to be found, Mr. Bates thinks, in this possibility, for the present low prices of wheat. In fact, he argues very vigorously that the low price of wheat ought to be a decided advantage to the British miller, in place of a source of worry, as he takes it to be just now.

The whole subject is suggestive of possible changes in the economy of milling and wheat growing the world over in the near future; and in these changes Canada is very considerably interested.

ARE MILLERS SLOW?

THIS is a question suggested by the letter of a correspondent on another page. The inference is that millers are lacking in that push and "go," common to almost every branch of trade in the present day.

Let us investigate. The miller of tradition has been

pictured as an easy-going individual, a man of unusual evenness of temper, and possessed of a placidity of disposition, that was remarkable compared with that of his fellowmen. Where other mortals would worry over the "thousand and one" disturbances of life, he took things as they came to him, and whatever turn the wheel of fortune might make, he was satisfied to accept the situation.

But the miller of tradition only lives in memory to-day. In the hurly-burly of the 19th century there is a sort of poetical rest in thinking of this old representative of the trade. We are not so sure, however, that he has not left behind him a race of followers, who, though, they may have changed their style a little, as has the Quaker of to-day when contrasted with his brethren of the broad-rimmed hat, have yet failed to nearly catch up in the procession.

We are warned to be careful, or we may be libeling some very worthy tradesmen, for whom we have the most perfect regard. To come down to particulars then, it may be asked, do you consider a trade that embraces such liberal, progressive and thorough-going businessmen as W. W. Ogilvie, M. McLaughlin, J. L. Spink, Pres. Baird, of the Dominion Millers' Association, N. H. Stevens, of Chatham and several scores of others, whose names are at our tongues' end, as lacking in either enterprise or intelligence? We are prepared to admit that one would travel far to find abler representatives of any trade than those whose names we have named. But to make an application right here. A minimum estimate of the number of men engaged in the milling trades in Canada is 1,000, and the figures are variously placed by others at 1200 and 1500. There is in existence in the Dominion an association of millers, the sole purpose of which is co-operation and union in the interests of the individual members of the milling trades, and the trade as a whole. Entrance to this association is easy and inexpensive. The men who comprise it admit that it pays to be a member, and yet of the thousand or fifteen hundred millers in the Dominion only some 250 are enrolled as members of the Dominion Millers' Association.

We have no brief for booming this organization, and we simply use the case in point as an illustration, that gives color to the view of our correspondent, that millers are slow. The gain is to every miller who is a member of this Association. We believe that a large percentage of the enterprising men of the trade are in the association, but if we are to limit the go-ahead men to twenty or twenty-five per cent. of the whole, we are admitting about as much as our correspondent contends for.

Take another case. It is absolutely necessary to the success of milling in Canada, that a large portion of the product of the mills should be exported. Even allowing for all the discouragements in export and home trade during the past year or two, have millers been as alive, as they might have been, to catch all the export trade that was coming their way? We have gone to some trouble recently to enquire into the nature and conditions of flour trade with the West Indies. Considerable matter was published in these columns last month, and we have something more to say on the question this month. This enquiry has brought to us information and correspondence from different points. Some of this correspondence has indicated, where it might not be expected, a large measure of indifference, and to use an expressive business term of the day, a want of "snap" has been most noticeable. In other cases correspondents who have had a good deal to do with the India trade have plainly stated in their letters to us, that Canadian millers were not to-day enjoying that large share of trade with those colonies that rightly belongs to them, because they did not seem to care to trouble themselves to secure the trade.

The analysis of Canadian flours, published in the last issue of the MILLER, ought to have aroused, one would have supposed, considerable interest in Canadian milling circles. This was the opinion of a number of the progressive millers who had seen and studied the analysis. They anticipated, so soon as it was made public, that it would have put our millers on their metal, and they would have been quick to disclaim the inference of that analysis, that they are unable to make as good a flour for the West India markets as what comes from some of the United States mills. We, ourselves, opened up a correspondence with millers in different

parts of the country, drawing their attention to the Demerara analysis, and are free to confess that with few exceptions the response has been anything but complimentary to Canadian milling enterprise.

Are Canadian millers slow?—is the question asked. Reader, what do you think?

EDITORIAL NOTES.

A SUGGESTION has been made that it would be a good stroke of missionary enterprise to send someone to China and have them educate the Celestials in the eating of white bread. We do not know but this would be a good move with many foreign countries, as a means of creating new and improved markets for the consumption of flour. As Englishmen need to be taught to relish tomatoes, so many foreigners have to be taught how much they miss when they are satisfied with the coarse breads of their own countries and do not eat bread from wheaten flour.

A GERMAN writer tells us that "In the middle ages, millers could not go to war—from the exigencies of their trade—and, as war was the only avenue to glory, they were consequently held in little esteem. In the time of Charlemagne the prejudice against millers was so great—it being thought (no doubt, erroneously) that they took too much toll—that no son of a miller could aspire to any position in the church. The town of Ulm ordered that no miller should be allowed to keep more than three pigs. In the sixteenth century millers were compelled to furnish the hangmen with gallows ladders, and only long afterward, when this connection with the hangmen ceased, did the millers come to be taken into the ranks of honorable men, where," as the writer quaintly adds, "they are still."

As is his wont, Mr. B. E. Walker, general manager of the Bank of Commerce, in his annual address, of a few weeks ago, discussed the trade of the country in general, and in doing so devoted a large share of attention to agricultural conditions. Northwest matters received much consideration. The low price that has prevailed for wheat, has, in the opinion of this banker, seriously affected the prosperity of that country, and it becomes a question what is the solution of the problem. Mixed farming is suggested, "but the fact remains," to quote Mr. Walker's own words, "that for years to come wheat must be the main item in what they have to sell. But doubtless, as with most of the world's products the question is one of transportation." Mr. Walker is cautious in what he has to say on this question, accepting the claim of the C. P. R. that as railroad profits run now rates are as low as they can be made. "But it is also true that railroads will, year after year, be forced to lower rates, and must somehow carry wheat to Europe at prices which will be a living profit to the farmer for a series of years." A solution, however, of the transportation problem is not, so this gentleman thinks, as does Mr. Campbell and many other students of the question, to be found in more favored railroad rates, but rather in an extension of our water-ways. There can be no question that we must face as a people, this water-way question, at an earlier date than some would seem to anticipate now. It is a problem for Canada, and as we remarked a month ago the interest in it is growing apace.

It would seem that the promise given by the preparations at Niagara Falls for the generation of electric power is likely to bring the advocates of rival power systems into the field. It is not improbable that within a few years experiments on a larger scale will be possible on the relative efficiency of power transmission by compressed air and by electricity. Professor Unwin has treated the subject of compressed air as a motive power in a recent lecture. He considers transmission by it as practical, to a distance of 20 miles at least. He maintains that 10,000 horse-power can be transmitted to a distance of 30 miles in a 30-inch main at 132.3 pounds per square inch with a loss of pressure of only 12 per cent. The efficiency of such a plant is said to be 40 or 50 per cent. if the air is used cold, and 59 to 73 per cent. if the air is reheated. In order to put the system to a thorough test on a large scale it is now proposed to produce power at Niagara Falls by compressed air competition with electricity.

FLOUR MILL INSURANCE.

ONE of the subjects placed on the program for discussion at the annual meeting of the Dominion Millers' Association to be held next month is that of flour mill insurance. Without anticipating what form the discussion may take it is not unlikely that the following able paper read before a millers' meeting at Kansas City, Mo., will be found helpful and suggestive to those who are giving thought to the matter. The writer of the paper starts off with the truism: Every millowner fully understands the need of good and effective insurance, and he generally carries sufficient insurance to protect himself if his policy be properly written, but he generally leaves the writing of the policy to the agent representing the insurance company. The agent usually does not understand how to properly distribute the insurance, and he is liable to get too much on one part and not enough on another, and possibly leaves some without any insurance at all.

If you have a steam mill with frame buildings and brick engine and boiler house, your office possibly located in one corner of the mill, with your wagon scales just outside the office, your policy usually will read something like this: So much on your 30 x 40 feet, two and one-half story and basement, shingle roof, frame mill building and 30 x 50 feet one story metal roof brick engine and boiler house; so much machinery, scales, tools, fixtures, etc., all while contained in the above described mill building; so much on engine and boiler house; so much on grain, flour, meal, feed, sacks, oils, etc., all while contained in above described mill building.

There may have been one or more additions to your building which your policies do not mention. After having met with a loss you get your policies and read them, possibly for the first time. You are somewhat surprised at their condition. You find the written portion, that part which binds the insurance company, very brief, but the printed stipulations, that part which binds you seems to almost relieve the insurance company of any responsibility whatever. Yet you think that you will have no trouble collecting your insurance. You have always been a liberal patron of the insurance company; you have paid your premiums promptly, and you think the insurance company will be pleased to pay you the full face of your policy without hesitation or delay. You notify the insurance company of your loss. They send an adjuster to settle with you. He plies you with various questions regarding the origin of the fire and gives you to understand that you, being the proprietor ought to know all about it, and winds you up by asking you for a list of stock and machinery and amount and kind of material used in the building.

This list you can only furnish in a partial way; you can't remember everything you had in the mill, neither do you remember the amount and kind of lumber and other materials used in the building. However you furnish a list and inform him that it is only a partial one. From this list he estimates that on your buildings and machinery you were considerably over-insured. He reads your policy and lays great stress upon the wording of it, and under no circumstances will he allow you anything not provided for in the policy. He informs you that your building could not possibly cost as much if new, and that by its nine years of use and decay it has depreciated 38 per cent. He tells you that the basement walls were never very good, but he will allow 20 per cent. for replacing the upper twelve inches and repairing a certain portion that has fallen down.

This he considers a liberal allowance. The engine and boiler house walls he finds in good condition. He will pay for replacing the roof, floor, windows and door. He makes the same reduction on machinery, scales, etc., for depreciation that he did on the building—38 per cent. The engine and boiler are not damaged much; he allows for some new piping, new valves and oilers and cleaning up. The smokestack, which fell down and was ruined by the fire, he informs you was not insured. There is no mention made in your policy of the pumps and heater. They are completely ruined. He will allow nothing on them. He also informs you that you had no insurance on the two-story addition, in the first story of which you kept some of your sacked products, and in the upper story of which was located your feed bins, nor on any of the products contained therein. The car of flour just loaded and the car of wheat yet unloaded are not insured. He will allow a loss on the beam of your wagon scales, but the scales themselves are without the building and uninsured. The long platform with roof over it, running the full length of the mill, is not insured, and the office furniture is not insured. He estimates that your loss amounts anywhere from 40 per cent. to 75 per cent. of the amount of your insurance, and offers to settle with you on this basis and pay you at once if you will make a reduction of 1½ or 2 per cent. for the use of the money for the sixty days reserved by the insurance companies to make settlement in.

If you refuse to settle on this basis, he tells you that possibly he may be wrong, but that he has adjusted a great many losses

and has never made a more liberal allowance to any one, and that he seldom meets with a refusal to accept of his adjustment. He informs you that you are not obliged to accept his proposition; that there is a stipulation in the policy which provides for cases of this kind. He reads it. It provides that "if at any time differences shall arise between the insurance company and the assured as to the amount of loss or damage, or as to any question, matter or thing concerning or arising out of the insurance, every such difference shall, at the written request of either party, be submitted, at an equal expense to each of the parties to two competent and impartial persons, one to be chosen by each party and the two chosen shall select an umpire to act with them in case of their disagreement, provided, however, that none of the persons so chosen shall be interested in the loss as creditors or related to the assured or sufferers, and the award, in writing, of any two of said persons shall be binding and conclusive as to the amount of such loss or damage or as to any question, matter or thing so submitted, but shall not decide the liability of the insurance company, and until sixty days after such proofs, declarations and certificates are produced, and examinations and appraisals permitted, the loss shall not be payable." He now submits the matter to appraisal, asks you to sign an appraiser's bond and name an appraiser to act for you. You know if you submit to appraisal the settlement of your loss will be greatly delayed, and in the end may be settled by the courts.

Your mill has been completely destroyed. Financially you are penniless. The insurance company has in its possession all that belongs to you. You possibly have some creditors to which some of this insurance is assigned, who are urging you for a settlement. You regret very much to accept as payment in full 50 per cent. of what you were paying premiums on. You never knew before how cheap was everything and what a small amount of material enters into the construction of a mill. You now realize that you are a victim, as it were, between the devil and the deep sea. You take the list furnished him and discover that you have not included any belting or shafting and possibly some few other things. He readily adds the value of these, which adds considerable to the amount on which he offered settlement in the first place and if you could recall any other items they would be as readily added. You know the amount he offers you will not rebuild your mill, and in order to do so it will be necessary to go considerably into debt or interest outside capital. You conclude on the best course and accept his proposition, pocket your small allowance and dearly bought experience and start anew. If you have a new mill built by contract or otherwise you know just what it has cost. Should you insure it for what it costs and it should burn immediately it would hardly be possible to collect the face of your policies.

There is always a salvage. If your building is brick or stone, much of the walls and foundations are generally saved, the boiler is seldom damaged beyond the fitting, the engine seldom more than one half, the walls, foundation of the boiler, which cost about one-third the amount of the boiler, are seldom injured. The foundation to engine, which cost 15 to 20 per cent. of the cost of the engine, is never injured beyond the cap-stones. The machinery in the mill, if completely burned, is seldom worth anything to repair, yet a shrewd adjuster will find a salvage of from 10 to 25 per cent. It would be impossible to collect a loss of from more than 60 to 80 per cent., and this when the property is new and without depreciation. Insurance companies, in adjusting losses, usually estimate a depreciation of 5 per cent. per annum on frame buildings, except the roof and floors, which are estimated at 10 per cent. per annum; machinery at from 5 per cent. to 10 per cent. per annum.

The depreciation clause of any insurance policy, while only a silent phrase in your policy before a fire, proves to be the giant robber in taking from you premiums on policies you cannot collect. But why pay premiums on policies for more than you can collect in case of loss. Read your policy carefully and you will find that it will be impossible to collect for more than you lose. But how are you to estimate what amount you will be able to collect on your plant in case of loss? To determine this exactly will be impossible, but the loss is yours in any case. Every millowner should have a complete set of plans and specifications, showing in detail all the material, its dimensions and condition, every machine, scale, tool or fixture used in the plant, and when changes are made they should be marked in the plans. From these plans and specifications can easily be determined the value on your plant, and will be a means of saving you considerable money in case of loss. Attend personally to the writing of your policies and see to it that everything is insured and insured in its proper place, and insure it for no more than it is worth. Four-fifth is better. In case of loss, figure from these plans and specifications, submit to a reasonable reduction for depreciation, and you will have no trouble in collecting your insurance.

THE WORLD'S WHEAT PRODUCTION.

IN recent years there have been some striking instances of inability to approximate the year's production of wheat, in various countries, at a time soon after harvesting, the estimates then offered being subject to important modification by the subsequent evidences furnished by the recorded movement. Among the trade journals which have displayed care and enterprise in collecting data calculated to give intelligent comparisons of such supplies is the Liverpool Corn Trade Journal, which has recently published revised estimates in detail of the wheat crop for six years—its estimates showing important increases in comparison with earlier calculations for the United States, Argentina, Russia, Hungary, Italy, Germany and Spain; and decreases of more or less importance in Austria, Canada, Chili, Uruguay and India. The net addition to estimates last September is 136,000,000 bushels, or six per cent—the early estimates being 2,213,000,000 bushels now increased to 2,449,000,000. The total for six years are shown in the following—

	Bushels.
1888.....	2,294,000,000
1889.....	2,174,000,000
1890.....	3,272,000,000
1891.....	2,452,000,000
1892.....	2,413,000,000
1893.....	2,449,000,000

The Corn Trade News has not adhered to official estimates, as for instance the crop of the United States for 1890 to 1893 are stated at 410, 660, 550 and 460 millions respectively (aggregating 157 millions in excess of official estimates, the last two estimates conforming to the basis adopted by the Price Current, while the previous two years are 35 million below the 430 and 675 millions recognized by the Price Current as the probable production for those years. The notable feature of the exhibit by the Corn Trade News is its estimate of the crop of Argentina, placed at 90,000,000 bushels for 1893, and 55,000,000 for 1892. While we cannot deny the approximate accuracy of these figures they reflect an enlargement over estimates for previous years which are difficult to reconcile with the probable increase in wheat culture in that country in recent years.

We copy the following totals from the detailed exhibit of yearly production, the figures representing millions of bushels:

	1893.	1892.	1891.	1890.	1889.	1888.
Europe.....	1,430	1,367	1,222	1,361	1,216	1,385
N. America.....	515	615	727	466	532	457
S. America.....	108	76	60	51	37	47
Asia.....	319	297	364	306	310	338
Africa.....	36	39	47	49	32	41
Australia.....	41	37	32	59	42	26
Aggregate.....	2,449	2,413	3,452	2,272	2,174	2,294

This statement is for crops harvested prior to September 1 of the years indicated, excepting in the instances of Argentina, Uruguay and Chili, which are crops "harvested in December and February following," the month of January being generally recognized as the harvest period for these countries.

It is interesting to note that the average yearly production indicated for the first three years of the period shown in the statement was 2,247,000,000 bushels, while for the last three years the average rose to 2,438,000, or 191,000,000 increase, which is suggestive of the cause of the world's plentifulness of wheat during the past two or three years—Cincinnati Price Current.

IN PRIMITIVE DAYS.

In Bulgaria wheat is threshed in a primitive manner on the bare ground, but it is remarked that among three different samples of hard wheat there was not a single broken grain. The flour receives high praise. Though rather dark, each sample on being rolled between the forefinger and thumb has that gritty feel which millers so highly value. Each flour is described as of extraordinary strength. These samples do not appear to have received any elaborate dressing; but modern milling has made its way into Bulgaria, and the principality now possesses flour mills fitted with machinery of an advanced type. The enterprise which has brought these mills into existence appears, moreover, to have already met with its reward.

Advertise in CANADIAN MILLER. It pays.

MANITOBA FREIGHTS.

MR. Nicholls, of Fort Qu'Appelle, thinks to answer Mr. Campbell, of Montreal, is very simple, as to the reason why Manitoba hard wheat is worth 90c. per bushel in Liverpool, while the farmer at home should be getting only 45c. for it. Mr. Nicholls says: "For every bushel of wheat the farmer shipped from Qu'Appelle, or adjacent stations, to Toronto, he would have to pay within a fraction of 31c. per bushel freight to the C.P.R. If the rates are anything like proportionate between Toronto or Montreal and Liverpool there will not be much left for coast handling or any speculation." Mr. Nicholls illustrates the excessive railroad rates, as he alleges, as follows: "A first-class ticket from Winnipeg to Vancouver costs \$45, but a ticket from Regina (nearly 400 miles less distance) costs \$56.15. The Qu'Appelle Vidette last September stated the case of a party coming west on the same train as the editor, and who got a ticket from Detroit to San Francisco for \$37.50. A lady, Mrs. Crawford, took a return ticket from Winnipeg to Qu'Appelle, and wanting to go to Kamloops, found she could save \$11 by returning to Winnipeg and taking a ticket to Vancouver. A ticket from Qu'Appelle to points in Ontario costs nearly twice as much as a ticket from the same points to Qu'Appelle." Take the local freight rates: One half a car of binding twine, from Brandon to Grenfell, 150 miles, last year the Grand Secretary of the Patrons of Industry paid \$62.50. The Edmonton Bulletin last fall stated that it cost 42.30 cts. per bushel to ship potatoes from Edmonton to Lethbridge, 490 miles. Potatoes were scarce at Lethbridge, and plentiful at Edmonton at the time, but the rates effectually prevented their exchange between the two places. At a meeting at Moosejaw, at which Mr. Davin was present and made a speech, a Mr. Baker spoke on the freight question, and said that coal was carried through and sold in Winnipeg for \$7.50 per ton, while at Moosejaw, 400 miles nearer the mines, it cost \$9.60. Our local millers tell me the railway company demanded \$112 from them to ship a car load of flour from Qu'Appelle to Maple Creek, while carrying a car load of horses from Maple Creek to Qu'Appelle for \$56, and that by rebates and passes large milling firms to the east are enabled to buy wheat here, carry and grind it in their mills, and then ship the flour west to Calgary and other points, and sell it for less than millers here could possibly do. Then the export rates. We can raise the finest oats and barley in the world, but the rates are absolutely prohibitive, so far as their profitable export is concerned, and we are cut off in that respect altogether. In order to save middlemen's profits, settlers sometimes ship their own wheat, paying 30-6-10 cents per bushel, from Qu'Appelle to Toronto, or at present prices, nearly one-half of the entire exportable product is taken to ship the other half. If wheat is any-way damaged the case is still worse; the whole loss must fall on the settler, no reduction of freights or profits by the railway."

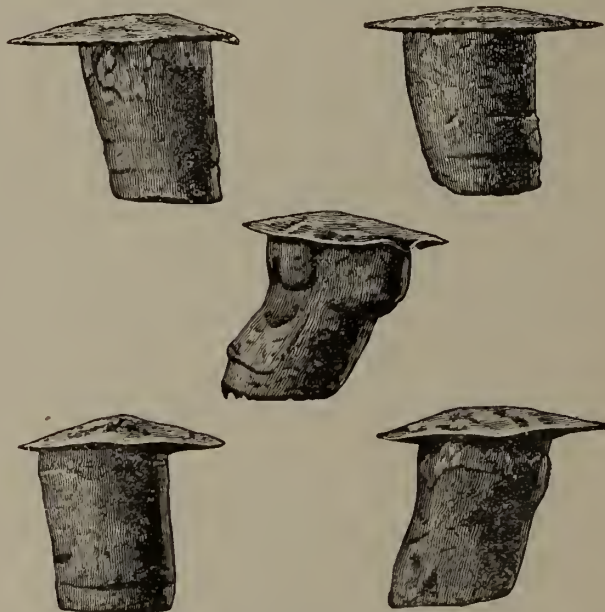
ECONOMY OF SUPERHEATED STEAM.

THE economical advantages of superheated steam in small motors were shown by tests of a Serpollet motor conducted by M. Seguin. The motor had a horizontal cylinder, 5.1 inches in diameter by 5.1 inches stroke. The cut-off was fixed at 66 per cent. of the stroke; the admission pressure was 58 pounds per sq. inch, and the revolutions 284 per minute. The brake horse-power on a four hours' trial averaged 4.57 horse-power, and the steam consumption was but 29.87 pounds per brake horse-power per hour. Comparing this result with those obtained with somewhat similar sized motors at the Plymouth trials of the Royal Agricultural Society, it will be found that the best engine there, a compound one, took 35.75 pounds of steam per indicated horse-power, while the best of the single cylinder engines took 57.75 pounds of steam per indicated horse-power. Practically the whole of the advantage shown by the Serpollet motor must, says Engineering, be credited to the boiler, which supplies superheated steam. This boiler consists of a stout tube flattened so as to deform the passage through into a narrow slit. This tube is coiled and has one end connected with a feed pump, and the other with the engine to be driven. The boiler used in the above tests had a heating surface of 26.8 square feet, and the grate area was 2.9 square feet. The

steam, though showing on the gauge a pressure of 58 pounds per square inch only, had a temperature of 1009° F. on issuing from the coil, which had fallen to 571° F. at the steam chest. The temperature of saturated steam at 58 pounds pressure is about 306° F., so as used in the engine the steam was superheated by some 266°. The output of steam was just 4.9 pounds per square foot of heating surface per hour. The fuel used was briquettes having a heating value as tested in the calorimeter of 8.28 pounds of water evaporated from and at 212° F. per pound of fuel, and as used in the boiler the efficiency was 67.3 per cent.

A CASE OF DEFECTIVE RIVETING.

THE driving of rivets, says The Locomotive, is such a comparatively simple operation that it might be supposed that it would be almost always well done. This is far from being the fact, and bad riveting is one of the commonest defects reported by our inspectors. The rivets may be too short, or too long, or too small; they may have heads that are too flat, or they may have projecting "fins," or they may not fill the holes, or the holes may not come "fair" with one another. There are many ways in which riveting may be bad. A case that recently came to notice seems to deserve special mention. The rivets in question were in a vertical pulp-digester, 10 feet in diameter and 30 feet high, which was to be so constructed as to be safe under a pressure of 90 pounds to the square inch. The plates were of steel, 3/8-inch thick, united by lap joints which were triple-



SOME DEFECTIVE RIVETS.

riveted on the straight joints and double-riveted on the girth joints. The pitch of the rivets in each case was 3 1/2 inches, and the distance between the parallel rows was 2 inches. The rivets were 3/4-inch in diameter. Before the digester was accepted, we were called upon to inspect it and pronounce upon its safety. The inspector found the rivets "driven very low," that is, the heads were entirely too flat, as shown in the accompanying cuts, which are made directly from photographs of the rivets. He had a number of these taken out and found that the holes in the two sheets did not come opposite one another fairly. This defect is a common one, and it is very serious, both because it reduces the shearing area of the rivet, and because it greatly increases the difficulty of making the rivets fill the holes perfectly. A shop that turns out work of this kind is particularly censurable, not only because the work itself is poor and weak, but also because the defect is not easy to discover, after the rivets are in place, and the owner of the boiler is therefore likely to be deceived by a fair external appearance and to carry more pressure than the boiler can safely withstand. The inspector also found that the heads were not driven evenly over the holes, the centres of the heads often lying well towards the side of the rivet. This defect, although not so dangerous as the unfairness of the holes, would not be tolerated in a good shop having any pretensions to turning out first class work. It is very easily detected, even by one who has little experience in inspecting, and there is no excuse for it, whatever. The rivet holes were not countersunk, as they should be in all good

work, and, taking everything into consideration, we think this case presented the finest example of notoriously bad work that we have seen in some time. The only thing that could be done to it, in the way of improvement, would be to cut out all the rivets, ream out the holes until they should be true, and rivet them up again with larger rivets. The most reprehensible thing about the job, perhaps, is that the builder used rivets that he knew to be *too short*. At least, we presume he knew them to be so, for any one who had the smallest idea about the business would know it. A boiler ten feet in diameter, to carry 90 pounds of steam, and with five or six men working about it, cannot be built too carefully; and any such reckless performance as putting in rivets that are too short and too small comes very near being criminal negligence. The joint used in this digester is far from being beyond criticism. To begin with, a *lap* joint should not be used at all; a *butt* joint would be much safer and better in every way. Taking the tensile strength of the plate at 60,000 pounds per square inch, and the shearing strength of the rivets at 38,000 pounds per square inch, a little calculation will show that in the joint that was actually used the rivet area is far too small, so that with 3/4-inch rivets and a factor of safety of 5 the safe working pressure is only about 56 pounds. If a triple-riveted lap joint were used at all, the rivets should be an inch in diameter (holes 1 1/16 inch), and the pitch should be about 3 3/4 inches. This joint gives an efficiency of 72 per cent. and a safe working pressure (with a factor of 5) of just 90 pounds per square inch. But a double-weld butt joint is the proper thing for this case.

THE COMMON-SENSE WAY.

THE common-sense way of preventing the slipping is really the only one object to which we ought to direct our attention; there is the relation of the pulley to the belt, the method of placing a belt on a pulley, the question of speed, tightness of belts, all of which, with other points, require careful consideration. Oak tanned leather belts are best for general use. Cotton belts are best for dry places. It is economy to put on a wider belt rather than a narrow one too tight. Vertical belts should only be moderately tight.

USE LOW GRADE FLOUR FOR FEED.

A GENERATION ago, says a correspondent of the Northwest Miller, millstuffs were so little in demand that bran was run into the mill ponds, or a farmer was told to help himself from the pile. The Minneapolis mills spent time and money in proving the good feeding qualities of mill feed, and without such sales to-day of their offal, they could not hope to compete abroad on their flour. The united efforts of the mills and the systematic distribution of circulars and pamphlets to farmers and others, showing the value of the lower grades of flour, and encouraging them to use it, as they would be benefitted by the increased price of wheat, would surely result in doubling the consumption of all mill stuffs below a patent flour. The use of black bread for feeding purposes is quite common in Europe, and it is a common practice of the bakers here to use up their old bread by feeding to their horses. These points are not new to a great many, but to others they are new, and in order to make the use of the low grades of flour more common, it is necessary to bring it before the attention of the farmers and others, not once, but many times.

TRANSMITTING POWER.

IT is generally known that a shaft will transmit power in proportion to its running velocity, and therefore, the faster the shaft runs the lighter it should be within reasonable limit. The use of extremely heavy shafting is not advisable under any circumstances, unless actually needed to perform the work required. Some imagine that a large shaft, affording a very strong margin of safety, is the most economical and tenable mechanical position, unless tempered with sound judgment and much wisdom, sufficient of both to select properly. That there should be an ample margin of strength no one will attempt to deny, but shafting multiplies in strength so rapidly as sizes increase that the unenlightened are apt to make the selections much too large when aiming at only ample strength margin.

VIEWS AND INTERVIEWS.

Zola
On Speculation.

The famous French novelist, Zola, who was three times rejected by the "Immortals," of France, has been changing off from sensational novel writing to having something to say on so weighty a question as wheat speculation. Perhaps he goes on the principle that a change of occupation is as good as a dose of medicine. In a recent newspaper article he writes: "It is alleged that speculators today are constantly striving to reduce prices, while their predecessors only strove to advance them. Yes, the speculators are accused of very Machiavellian plans tending to cause advances and declines in turn, in order to rob both producers and consumers. Apparently, nothing is easier. In the months immediately succeeding the harvest, prices are reduced, and the farmer is compelled to sell at the lowest values. As soon as the crop is in the hands of the speculators, prices are advanced. In these allegations one thing is always forgotten, and that is competition. According to this, the most remarkable harmony must exist between all speculators. In truth, however, they are the ones who fight each other the most bitterly, and it is the generally beneficent competition which keeps prices at their proper level." He then gives figures of wheat values for the first and last months of each year from 1886 to 1893, to show that the variations have not been very great, and that the prices in months immediately after harvest have not been lower than the prices in later months, when the wheat is supposed to be in the hands of the speculators, from all of which he concludes that, if the speculators try to manipulate prices, as claimed by the farmers, the speculators are the ones who suffer most in the game. We guess Zola knows all about it. Oh yes!

Foreign
Wheat-cleaning.

Both the French and English milling journals, says the Northwestern Miller, are full of advertisements of wheat-washing machines and systems of wheat-washing and "conditioning" seem to be all the rage. This treatment does not seem to be confined to those wheats that are dirty and full of stones, or extremely dry, like some of our Pacific coast wheats. As is well known, before the days of the roller process, the "Darblay" flour made at Corbeille, France, had a large sale in England. The mills at Darblay made a very choice flour, and they washed their wheat, though in machines that were very cumbersome and imperfect, compared with the present apparatus, and the French millers still seem to practice washing, even for soft wheats. Mr. Masset, a millowner at St. Omer, writing to Louis Demaux—the Demaux is one of the oldest and best French washers—after stating the satisfaction the washer gave him, says that one great advantage of the improved washer is that the wheat is only in water a very short time, and is dried at once, hence the wheats from northern France can be washed to advantage. Another firm of French mill builders says: "With our new washing tub, we can give a complete guarantee for the washing of tender wheat, as well as hard wheat. The tests made the past year leave no doubt on this point, as they have been made in all parts of France."

Wheat
Reminiscences.

Reminiscences, as Artemus Ward has said, are sometimes quite amusing, though they may be a little more serious, perhaps, in their recollection to some, than this whilom humorist would want to intimate. One of the encouraging reminiscences to holders of wheat, says the Montreal Trade Bulletin, is to know that six years ago Manitoba and Duluth wheat was selling here at 90c, and three months afterwards the price had advanced 50c. per bushel to \$1.40. Commenting on this a shipper said:—"The price of No. 1 hard Manitoba wheat is worth about 70c. for export, or 64c. afloat Fort William; and if the prediction of Logan of Chicago, to the effect that the price of wheat will be 30c. higher within the next three months, is fulfilled, it will then be small compared with the advance of 50c. per bushel in 1888." He also stated that cable limits were being gradually increased, and that English buyers were asking shippers here to make firm offers, which reminded him of the similar conditions which existed at the com-

mencement of the big rise in 1888. Of course, what happened then is quite within the range of possibilities now, although if an advance of 15c. be scored within the next 3 months, shippers and dealers may consider themselves fortunate. A lot of No. 2 Upper Canada wheat was bought in this market a short time since at 55c., and at time of writing the purchaser is offered 62c. for it, and strange as it may seem, a lot of feed wheat was sold two or three days ago at 62½c., or ½c. per bushel more than could be realized for sound No. 2 white winter. The reason is to be found in the great scarcity of feed wheat, which of course, answers better for grinding for feed than the sound article. It is a singular occurrence, however, when the poorer quality of wheat brings the higher price. On the other hand, considerable feed wheat has been sold in this market during the past three or four months at very low prices, in some instances the proceeds failing to cover freight and charges.

"BOTTLING UP STEAM."

ANOTHER matter revealed frequently by the recording-gauge chart is the practice indulged in by many attendants, of "bottling up steam." Its time of most frequent occurrence is a few moments before starting time in the morning and at noon, and in some cases just before clearing fires. Of course it is the simple outgrowth of ignorance concerning the limited amount of steam in quantity they can so bottle up, and the very small service it can render, compared with the injury which the practice, when persisted in, ultimately does the boiler. Aside from this objection, the habit is exceedingly pernicious, because only a few moments, neglect would cause the pressure to accumulate to the point at which the safety-valve is supposed to open; and then, if it happens to be inoperative, an accident is almost certain to follow. No excuse should be taken in any shape, under any kind of reasoning, for "bottling up steam." If the generating capacity of the boiler is not equal to the current demand, it cannot be helped by simply bottling it up: in fact, it has been my experience that where the recorded line has been extremely crooked upon the first introduction of the recorder, the effect of such introduction has been to cause a much more uniform line from day to day, until the nearest approach to uniformity had been reached, consistent with the vicissitudes of the demands for steam. A steam-user once apologized for the appearance of his record, saying that the steam was drawn from the boiler at irregular periods by persons in the mill, and consequently the firemen could not carry any very regular line; that this use of steam was different from that in most places, etc. Noticing, apparently, my incredulity, he asked if I disagreed with him. My reply was: "Do you suppose that the steam necessarily falls as low as this record indicates?" In other words I called his attention to the fact, that, where a fireman is on the keen lookout for his boiler pressure and water level, he will readily detect the pointer-hand of his gauge the moment it begins to rise or fall, and govern himself accordingly. For instance, if he sees the hand indicating that the pressure is falling he will avail himself of the opportunity to slow down his feed, and perhaps open his damper wider, and if his fires are in prime condition, withhold fresh coal for a few moments; then when the onslaught upon his boiler has ceased, and the hand of his gauge is stationary, or starts to move upward, he will at once set about to replenish his coal and water, and so have his conditions favorable in a few moments for another attack upon his steam supply. When his steam is raising, he can afford to feed and to fire, and his thought should be to have everything in prime condition while he had surplus power and opportunity. Then he will not be caught so badly when these extreme attacks were made upon him. These extreme fluctuations, then, are largely due to the fact of his being unprepared to meet such emergencies; becoming alarmed when his steam has fallen 20 or 30 pounds, he attempts to get up by replenishing his needy fire with coal, which only tends for the time being to reduce the pressure still more, until it has become capable of delivering its gases, ready for combustion.

After this little explanation the proprietor shook his head, and said he had never thought of it in that light, and that he would have to call John to him and have a

talk with him. Now, the result of this was, that from that time on, the man's record never fluctuated in the same manner again, and the average steam line maintained was one which showed constant firing frequently in small quantities, and keeping himself in shape to meet these emergencies. Undoubtedly the man had to work a little harder at first, but afterwards it was easier when he properly understood the matter and manipulated his fires accordingly. The suggestion from the proprietor was exceedingly valuable. It resulted in teaching his man, and in mutual regard between them afterwards, because it showed that the man was capable of being taught, and willing to be, and that the proprietor had evidence of resulting fidelity. The dissemination of knowledge among firemen can certainly do no harm, and when it reaches a man who desires to hold his position, and give satisfaction, it will do much good.

SOME CONSIDERATIONS ON GLUTEN.

IT has long been recognized says Wm. Jago, in the British Baker, that the gluten of flour is a most important factor in determining its quality. Unfortunately, the absolute percentage of gluten does not necessarily indicate in terms of direct proportion the value of the flour even in those particulars which are closely associated with the gluten present. Not only does the amount of gluten affect the result, but so do also its character and quality. To give examples: Flour from the finest spring American and Manitoba wheats, yields roughly, an average of 40 per cent. of wet gluten. Flour from what is known as "goose wheat" may yield as high as 55 per cent. of gluten in the wet state, and a corresponding amount when dried. This goose wheat, by the-by, is stated to be a degenerate Kubanka, grown from original Kubanka seed which has deteriorated by repeated cropping under conditions unfavorable to the maintenance of the original good qualities of the wheat. So, too, occasionally, Russian wheats imported from and grown in that country produce flours of similarly high gluten, and yet of very inferior quality. On the other hand, Hungarian flour with a much lower average of gluten than is possessed by Spring American, absorbs far more water, and is a very much higher-priced flour. Quantity of gluten alone has therefore, without reference to other considerations, no absolutely direct bearing on the quality of flour.

With such marked differences as exists in the physical characters of flours containing perhaps approximately the same amount of gluten, one's attention is naturally directed to the nature of the gluten itself. Variations in its character may be due to two causes—first, to actual physical differences in the chemical substance; second, differences in the chemical composition of gluten itself.

There is abundant evidence to be drawn from other sources which by analogy goes to prove the possibility of differences in physical character. Every one knows that white of egg is coagulated by heat, and, further, that the degree of hardness depends on the length of time during which heat is applied. The most remarkable physical alteration is not essentially accompanied by chemical change. So, too, pure india-rubber may become hard and almost brittle, and yet be very simply restored to its soft and elastic condition again without undergoing chemical change. So, too, the character of gluten may be governed by conditions which have affected its physical character.

But in addition to all this the fact that gluten is not one chemical compound, but a mixture of several compounds, leads us to the inquiry as to how far complexity of composition governs the quality.

Readers are probably acquainted with Ritthausen's views of the composition of gluten, namely, that it consists of three separate albuminoids, termed respectively gluten, mucin, and vegetable fibrin. These are separated from each other by digestion with alcohol, in which the two former are soluble, the fibrin remaining behind the mucin is also viewed by Gunsberg and others as not being a distinct body, but rather fragments of fibrin separated in a flocculent state.

Rock emery millstones are said to be rapidly coming into use. It is claimed that they are wonderful grinders and it seems quite natural that blocks of rock emery should cut faster and last longer than anything else.



Office of the CANADIAN MILLER,
July 10, 1894.)

THE GENERAL SURVEY.

AN advance of $3\frac{1}{2}$ c. in the price of Chicago wheat a few weeks ago, gave something of a stimulus to wheat trading. The opinion was quite strongly held by some that this advance augured a general strengthening of the market, and the turn was supposed to have really come. It was only another case, however, of disappointed expectations, for the market drags along again as disorganized and uncertain as ever. General mid-summer dullness pervades every branch of trade, and the wheat market seems to have imbibed the infection perfectly.

Saying this much, which is not any more encouraging, than what writers on grain topics have been compelled to indite for a long period of time, there is nevertheless the opinion afloat, and with those who are considered authorities on the question it does not down, that a better price for wheat will be the record at no very late date.

This will be ascertained with more accuracy, so soon as the new crop commences to be marketed, for the view of advanced prices finds its chief argument in the belief that the acreage of wheat sown this year is much smaller in all countries, than had been expected. Grain growers are said to have been scared off extending the cultivation of wheat, with such a terribly overstocked market as has existed for some time. But we shall see.

The following are the figures given at the dates named, or visible supply of grain in the United States and Canada, east of the Rocky Mountains.

	Wheat, bushels,	Corn, bushels,	Oats, bushels,
July 1, 1894.....	54,657,000	6,441,000	2,577,000
Decrease.....	1,196,000	743,000	
Increase.....			221,000
July 1, 1893.....	62,317,000	8,076,000	3,300,000
July 1, 1892.....	24,356,000	7,841,000	4,973,000

Ordinarily these figures would favor better prices, for they show the immediately available supply to be 14,000,000 bushels less than at a corresponding period last year. We can have no assurance, however, taking ones cue from recent experiences, that prices will square themselves with any figures or calculations that are made these days.

What the new crop will bring forth is an uppermost question with everyone interested in wheat. In fact, weather conditions are largely responsible for whatever fluctuations take place in the market. The report comes favorable from some leading centre of wheat growing operations and prices are depressed. It may only be a few days when unfavorable weather reports will be printed and prices show a tendency again to advance. Without discussing the question of size of crop to acreage, as compared with other years, the reports generally of the conditions of the growing crop are favorable.

To give home affairs first mention: On another page we publish in full the crop report of the Ontario Bureau of Industries, which brings conditions up to June 15th. This is favorable to a good crop of wheat in Ontario. Reports from all leading centres, which bring conditions up to date, do not alter the reports of a few weeks ago. Things look favorable for a good average crop for the province. Official crop news from Manitoba places the wheat area this season at 1,010,186 acres, which is about 7,000 acres greater than that of last year, and marks the largest area ever sown of wheat in Manitoba. This does away with the opinion that had been held quite strenuously by some that the wheat acreages in those provinces would be lighter this year. It is not so easy a matter for those who officially watch affairs to tell us what is likely to be the outcome of the crop. The situation is reported to be a mixed one; reports from the same sections being of a very contradictory character. There is nothing to indicate that

there can be anything better for the Northwest than a moderate crop.

There seems to be hardly any doubt that United States crops will turn out well. Of course, there is time enough yet to see a very considerable change in any figures that may be given to-day. The Cincinnati Price Current of recent date names the wheat crop of the Republic at 475,000,000 bushels. It may be interesting to note just how far these conservative figures will be altered. The latest official account from Russia places wheat and rye above the average crop. No doubt Argentina will cut a greater figure than ever in the market this year, with a crop just far enough in excess of previous years to knock out any calculations that may be made on this side. On the other hand, certain reports, both from Germany and France, tell of weather conditions that are quite unseasonable, and that must have an unfavorable influence on the crop. But after all, at this time of writing there is a great deal of conjecture in anything that can be written of the coming harvest. Everyone interested must simply "watch and wait."

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—White, 58c. to 59½c.; red winter, 58c. to 59½c.; goose, 57c.; No. 1 hard, 73c.; No. 2 hard, 71c.; winter wheat on the northern, 59c. to 59½c. Trade Bulletin, Dominion Millers' Association, says: "Buyers car lots Ontario fall wheat, 57c. to 58c. on G. T. R., demand light. Holders asking 58c. straight, and 51c. for spring on G. T. R., and 59c. to 61c. on C. P. R." Montreal: Local market quiet. No. 1 hard quoted at 74c. to 75c.; No. 2, 71c. to 73c. Chicago: For cash—No. 2 spring wheat, 56c.; No. 2 red, 56c. September opened 57¾c, closed 58¼ to 58¼c. Buffalo: No. 1 hard, 67¼c.; No. 1 northern, 65¼c.; No. 2 red, 58c.; No. 1 white, 61c.; No. 2 extra white, 60c. St. Louis: 53¾c. for cash; 54¼c. for July; 52¾c. for August; 53¾c. for September; 57c. for December. Duluth: No. 1 hard, 63c. for July; No. 2 northern, 62¾c. for July; No. 1 northern, 55¾c. for September. Toledo: 55¾c. for cash; 56½c. for August; 57¾c. for September; 61c. for December.

BARLEY—Toronto: No. 1 (outside), 43c. to 45c.; feed, 39c. to 41c. Very little doing in Canadian barley in American markets. Montreal market quiet, but steady. 50c. to 53c. is quoted for malting grains, and 45c. to 46. for feed.

OATS—Toronto: Market is easy. Car lots on track quoted at 38c. to 39c.; white offered at 36c. Montreal sales of No. 2 at 42c. to 42½c.; No. 3, 38c. to 38½c. Buffalo: Offerings light; No. 2 white, 50½c.; No. 1 white, 51c.; No. 3 white, 50c.; No. 2 mixed, 49c.

PEAS—Toronto: Offerings very light. 56c. bid for No. 2. by exporters. Montreal: 73c. per 66 lbs. is obtainable afloat, with 73½c. asked, says the Montreal Trade Bulletin.

RYE—Toronto: Trade is only nominal. In Montreal sales are reported at 52½c.

THE FLOUR MARKET.

If anything, there is a slightly better feeling in regard to flour, though it may require some effort to perceive it. Export trade with the United Kingdom looks a little more hopeful. W. J. Stockman, the well-known flour handler of Leeth, writes us: "Flour trade has been very bad, no chance of escaping losses in importing. The sale, however, has been better within the last fortnight and I think we have passed the worst. Prices, however, are practically unchanged." Reports from Minneapolis are of a dull domestic and export flour trade. A higher price being asked for flour, foreign importers are not disposed to accept this. At Duluth the out-put of the mills is largely circumscribed the past few weeks. At the same time the expectation is that the mills will, almost right away, be running at their full capacity. Trade with local millers continues of a very hand-to-mouth character, and it is the exception when millers get anything that might be termed a handsome order.

PRICES OF FLOUR AND MEALS.

TORONTO—Flour: (Toronto freights) Manitoba patents, \$3.70 to \$3.75; Manitoba strong bakers, \$3.45 to \$3.50; Ontario patents, \$2.90 to \$3.00; straight rollers, \$2.60 to \$2.85; extras, \$2.50 to \$2.60; low grades, per bag, 85c. to 90c.; brans, \$13.00; shorts, \$15.50. Trade

Bulletin, Dominion Millers' Association, says of Ontario flours: "Sales of straight roller, \$2.75, and 90% patents at \$2.85, f. o. b. Bran \$13.00; shorts, \$16.00 and \$17, f. o. b."

MONTREAL—Flour—We quote: Patent spring, \$3.40 to \$3.50; Ontario patent, \$3.10 to \$3.20; straight roller, \$3.05 to \$3.10; extra, \$2.50 to \$2.70; superfine, \$2.25 to \$2.45; city strong bakers, \$3.40 to \$3.50; Manitoba bakers, \$3.25 to \$3.40; Ontario bags, extra, \$1.30 to \$1.40. Oatmeal: Rolled and granulated, \$4.60; standard, \$4.45 to \$4.50. Pot barley is quoted at \$3.75 in barrels and \$1.75 in bags; split peas, \$3.50 to \$3.60; bran, \$16.00 to \$16.50; shorts, \$18.00 to \$19.00.

DOLLAR WHEAT.

"WE will never see dollar wheat again," is the way many disappointed ones express their views on the price situation. Such views have existed many times before. When there are long periods of depression it is common to feel that depression is to be the normal condition for all time. But experience teaches that prices are elastic and advance quite as easily as they decline, when conditions favor it. Cost of wheat raising has been reduced by more scientific methods, it is true, and to that extent prices are permanently reduced, but beyond that there is no less reason to look for better markets than during other periods of depression. Too much has been produced in the last few years for the demand, and that is all there is to it.—Market Record.

NEWS AND NOTES.

Mr. Drury, of Colborne, is about to commence the erection of a new mill to cost about \$13,000. Foundation and first story will be of stone; second story, wood. It will be run by water power, the water being brought to the mill a distance of 2000 feet, through a wooden conduit, and having a fall of 60 feet. The power will also be employed to drive the electric plant.

A special meeting of the Montreal Corn Exchange was held a few days ago for the purpose of protesting against the irregular inspection of grain which has been going on. It is claimed that one of the Toronto inspectors has been granting certificates for grain shipped from Montreal, contrary to the act which limits his jurisdiction. The meeting decided to communicate with the Inspection Committee of the Toronto Board of Trade about the matter.

At the last quarterly meeting of the Winnipeg Board of Trade the following boards were elected under the provisions of the Dominion inspectors' act: Grand examiners, S. H. McGaw, J. A. Mitchell, Stephen Nairn, S. Spink and D. G. McBean. Flour and meal examiners:—S. Nairn, R. Muir, S. Spink, F. W. Thompson, C. H. Steele. General grain committee—A. Atkinson, N. Bawlf, J. A. Body, S. P. Clark, W. A. Hastings, G. V. Hastings, D. Horn, E. L. Drewry, D. H. McMillan, A. McBean, G. McBean, S. A. McGaw, G. J. Maulson, R. Muir, J. A. Mitchell, S. Nairn, W. W. Ogilvie, W. Martin, C. H. Steele, F. W. Thompson, A. G. McBean.

A cereal story—from the wheat kernel to the flour barrel.

Too much tension tends to destroy the elasticity of a belt, and when its tension is gone the belt is useless. Then, too, useless tension makes useless friction, and friction wears out journals and boxes, while it consumes more power.

The advantages of electrical transmission of power are largely those of the relation of the position of the machinery with the motive power of the establishment. Each room is entirely independent from other rooms, and any motor is always ready for service as long as the machinery from which it derives its electricity is in operation.

The old head miller and the newly acquired scrub got into a heated discussion regarding the flow sheet on the second day of the said scrub's arrival. "You don't know the first elementary principle of milling," shouted the head miller. "There's no use arguing with you; you don't even know what a syllogism is!" "I'll bet \$50," shrieked the scrub, purple with rage, "I'll bet \$50 I've milled more of 'em in one day than you have in three months."

COOPERAGE D'P'T.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

MARKET REPORTS.

The Mississippi Valley Lumberman says of cooperage conditions in Minneapolis: "There seems to be a continual effort among the flour millers to reduce the price on barrels. If this is insisted upon, it will eventually result in the coopers using an inferior grade of stock in their manufacture. Barrels are about as low now as they can be and leave any profit, and any attempt to bear the price down much below that of the present time, could only result in the manufacture of a lower grade of goods. This would be unfortunate, as the coopers of Minneapolis have always made the best barrels on the market. The fact that none of the coopers are making contracts for barrel stock, but are buying what they need as they need it, makes the market a much steadier one than it was at this time last year. There is a probability of a raise in the price of elm staves in the near future. For several weeks they have been about the weakest thing on the market, and there are now a number of concerns that are making an exceedingly low price on them. Those who are interested in putting the price up, are at the present time, forced to meet the low prices. But it is thought that the low price men will soon be low stock men, and then there will come the time to make an advance. Canadian dealers say that the removal of the duty on staves will make no difference in the price, and when the coopers are sure that such will be the case, they will probably begin to think about contracting at the low price at which they are now able to buy. It is said that the Minneapolis shops are buying all the heading they want at 3¼c. per set, but they must be getting it outside the association, for there is no indication that any member of the association is going back on the agreement. Prices on hickory hoops are so low that those who have them for sale are not pressing them on the market, for fear they will be forced still lower."

Prices for cooperage stock at Chicago are reported unchanged. Pork barrels are selling at 75 to 80 cents the range being slightly lower than a week ago. Hoops are arriving a trifle more freely, but are still scarce, and prices remain firm. Heading and staves are in ample supply. Prices on flour barrel stock remain nominal and the demand light.

COOPERAGE STOCK MAKING.

By F. B. PRATT, IN "WOOD WORKER."

WHAT is a day's work for a stave saw? I give you my experience as not the greatest results. I think a twenty-four inch saw, with thirty horse power, running 1,500, will make, with good bolts, well hearted, about 5,000 to 6,000 daily, but I have made 8,000 and 10,000, and I am told that where the class of labor is the very best, with a first-class sawyer and saw filer, there is such a thing as making 12,000 staves per day with one saw. It is customary for the men who make staves to list them with a jointer. A double jointer will require two good listers to do this much work and keep up with the saw. I must confess that I have never had such success, but I also confess that the quality of labor, speed of saw and condition of timber, to say nothing of the filer's work being partially in fault, may have contributed to my difficulties.

What is true of stave sawing is also true of heading, and what is a difficulty in producing one is also a trouble with the other. Drying heading has difficulties and obstacles that no stranger to the business can imagine. The waste in getting the average out of a large yield is one of the most surprising things in the business. To the man who makes heading and never learns the art of matching, will say it can be done to some extent by the bolt makers for staves or heading getting bolts of average width. So far has sawed staves supplanted the old way of making by splitting them out, that with few exceptions all grades of work now are made of them. Care must be used in sawing the staves with the grain of the wood, not cutting bastard. As good a stave is pro-

duced for whisky work with a saw as if split and run through a buckler, or entirely made by hand.

If staves are uniformly straight they will all work with machinery, but if very winding a good joint can not be made, and the work of putting the stave in the barrel must be left to the hand cooper to do the whole job, as time in running machinery is what makes the average expense great. This is why the sawing of staves for butter firkins, churns and fish packages has increased so much. The syrup barrel of to-day is seldom anything but a sawed stave. Pork and lard packages are universally sawed staves, and pickle packages also come within the line of its service.

I notice stave men are learning new methods of saving the bad stock in their staves by the use of the stave planer. There is a quantity of stock made by a stave saw usually thrown away. Some cut off the odds and ends and sell them as "cut-offs," all lengths from 17, 18, 24, 26 and 28 inches long (30 inch staves being a pork barrel length, are a special make). The stave planer, by the use of beds and knives the right circle, changes the circle of the stave. While it is a good thing to do this cutting down of the weight and saving such a great amount of work to the hand cooper, it is not so good as if cut on a saw to the right dimensions; yet it answers for most purposes, especially where something to fill the deficiencies or leaks caused by the timber being cut cross-grained in obtaining a circle, is used. The planer is a machine that will come rapidly to the front in full dressing any stave that needs rapid drying; it is especially adapted to backing beer staves preparatory to hollowing them while green, with a hollowing machine. It was not the intention to mention this machine here, but it has presented itself for this kind of work and is well adapted for it, so we give it a passing notice.

Cypress timber has never been cut to any extent with a saw. There is a good reason for this. The timber will not split well for the purpose, and if sawed would have to be sawed just the opposite way to sawing oak, so the cypress is universally a rived and bucked or hand dressed stave. They are used only for molasses and kindred goods. A cypress stave is always straight; the wood, fresh cut, is soft and easily worked.

Cypress will most likely always be rived; being difficult to get the timber out of swampy localities, would naturally make it necessary to do this. The whiskey and wine men are using staves every day that are dressed with a plainer on both sides. If the cooper knows it, he says nothing, but keeps on sawing. The fact is, it is much cheaper for him and he is getting to understand that prejudice against such things does not pay. Parties who make staves for the California trade are having them sawed with the grain of the wood, then planed on both sides so no saw marks appear to give evidence against them.

Large cooperage plants sometimes own the timber they work in, often keeping a gang of stave makers in the woods the year round. Oil refiners often make their own barrels, but don't undertake to make heading as a general thing. Heading men make nothing but heading, taking it in the tree, sawing their staves and kiln-drying them to perfection before working them. As a general thing this is the most successful and cheapest way to make heading.

Many oil dealers on a large scale use but very few barrels now; tank wagons deliver oil to wholesale and retail buyers in cans. A stock of old barrels is always kept on hand to meet any rushing demand for oil in barrels. Any kind of an old barrel, coopered up, will answer for black oil, as this article is cheap and heavy, and is seldom put in a good, new barrel. An old tierce, with the wood hoops cut off and hooped off with iron, will answer for common black oil. Style in cooperage does not apply. The price is the thing. If it is only cheap, that's the thing for petroleum.

We have reached a point where a word is necessary about hoops. I have tried to be progressive in the line of cooperage all my life; have sought out all theories and systems, and usually have been in the advance on all points in the line of wood-bound work. The hard labor of splitting hoops to hand shave has been a thing difficult to avoid; many plans have been adopted of sawing the hoops, but with only the success of making a poor hoop, unless the material is exceptionally good. The man who selects a pole to split usually will select a

good one, easy to split, but the man who cuts a pole to saw takes knots and short crooks to an extent that the sawed hoop when done is but little better than an apology for a good, strong hoop. A hoop made of good second-growth, with a saw, sawed heavy enough, can be used very well, but a planer to make the hoop of uniform thickness is necessary, or the cooper is compelled to sit down at his shaving horse and shave the hoop over by hand, before working it. This causes him to curse sawed hoops. I have had sawed hoops from some localities that were splendidly made, and of good, tough stock; but let a lot of green men get to making hoops with a hoop-sawing machine, and when you go to use them you have not more than the value of freight on the car, unless they happen to have wood enough in them to bear planing; in that case you get something over width usually, which partially compensates for the additional expense and trouble of planing them.

The day for high-priced cooperage has gone by; the day for poor new cooperage is also a thing of the past, except where it comes in competition with cooperage made by prison labor. There our pork packer will buy it, and succeeds in making one the basis of value for the other. Country cooperage, made in the one-hand shop in a dozen different places, is bought up by a country dealer until car load lots are obtained, then they are shipped in on an open market and sold for whatever they will bring. This makes the market; some of it is good, some good for nothing, nearly all made of oil-barrel culls in the timber-producing districts, and often made of timber that is not half dry, such as oil-barrel stave-cutters throw away. But they sell when made into a barrel for pork, or lard tierces, pork half-barrels, etc.; no two packages are alike, even though they are made by the same men. I know packing houses which keep all kinds of new packages on hand in the thousands, shrinking up and drying away. They test them with one blow on the head with an adze; if it's a stiff head, they pass it; if slack, reject it. Of course, a stiff head can be flagged until it is tight; so when cooperage is loaded for market the honest cooper always is thoughtful enough to put in a little water to keep the package swelled tight until the test is passed.

THE GEAR BUSINESS.

THE gear business has grown to be quite extensive, so much so that one of the firms in this line has decided to secure a patent on bevel gears with plain surfaces for the flanks of the gear teeth. It may be that this firm has a special curve of their own to run with a straight flank tooth, but if they will look into the theory of the matter they will find that there is only one form that will work properly with a straight flank, and that form is determined by the flanks themselves, without any discovery being needed from any source.—Journal of Commerce.

FROM OTHER CAUSES.

If a certain brand of oil has been used in a cylinder for several years and for any reason it is desired to use some other kind, the new oil may not give satisfaction at first, but this does not necessarily prove that it is not good oil, writes W. H. Wakeman in the American Machinist. After using an inferior grade of oil for a long time, I commenced to use one of the best brands of oil in the market, but there could be no doubt that there was something wrong, as the engine could not be run with it. It was of the automatic, disengaging type, and as soon as the valve gear commenced to open the valves the vibration was so great as to cause them to be released at once, thus shutting off the steam before enough had been admitted to do the work. The remedy was to mix one gallon of the new oil with four of the old, and when the lot was used up mix another one, using two of the new and three of the old, and so on, until the new oil could be used without trouble.

TRADE NOTE.

THE exclusive right to manufacture in Canada the Wilson tubular dust collector, for which patents were granted in April of the present year, has been given to the Goldie & McCulloch Co., of Galt, Ont.

BANKS—"That young Wheatley is sowing wild oats at a fearful rate." Rivers—"And yet that young man to my certain knowledge was raised on good oatmeal."

CURRENT COMMENT.

WHAT constitutes good oats? According to the Mark Lane Express good oats are clean, hard, dry, sweet, heavy, plump, full of flour, rather like shot, and have a clean and almost metallic lustre. Each oat is a well-grown sample, should be nearly of the same size, and there should be a few small or imperfect grains. Then again, the hard pressure on an oat should leave little or no mark, and the kernel, when pressed between the teeth, should leave little or no mark. The skin should be thin, for it will be found that the size of the kernel will be less in proportion than when the skin is thick. The color of the oat is not very material, but white oats are generally thinner in the skin than black. Again, black oats grow on inferior soils. Short, plump oats are preferable to large, long grains. In all bearded oats there is an excess of husk, but oats are not necessarily bad because they are thick-skinned and bearded. They must, however, contain a less amount of flour per bushel than thin-skinned oats without beards, and so are worth less money. It is a question of degree in value received, rather than of badness of quality.

Of the 19,000,000 bushels of wheat held in Chicago elevators, the statement is made that a large proportion of this is out of grade, and the matter is to be investigated by the Chicago Board of Trade. The Chicago Tribune says: "One cites that it is currently reported that a considerable quantity of spring wheat stored here has been mixed with hard winter, making a mixture which is undesirable; that, as a result, it is almost impossible to sell spring wheat stored in such warehouses except by sample. The other reason assigned is the report that a large quantity of winter wheat has been kept in store for an unusual period of time, thus giving rise to the suspicion that it may be infested with weevil. The petitioners named a dozen members supposed to be experts, and asked that they be formed into this special committee. The request of the petitioners, of course, aroused immediate and bitter opposition on the part of the Warehousemen. The Elevator Association held a meeting in the afternoon, and prepared a protest signed by all members, and this was presented to the Board of Trade directorate in special session by Messrs. Ware, Murray, Nelson, Harper and Hannah. As a means of remedying the evil certain changes are proposed in the elevator grain system in Chicago. It is intended that the proprietors of elevators, or regular warehouses "are not to be engaged on or after July 1, 1894, either directly or indirectly, in the business of buying or selling, receiving or shipping, cleaning or mixing grain, and are carrying on, and intend to carry on, the business of public warehousemen under the laws of the State of Illinois."

The Hatch Anti-Option Bill, which has been before the Washington Congress for upwards of a year, has finally passed by a very large majority. Various amendments were made to the bill, but in its present form it is directed particularly towards the suppression of short selling, and its principle is that no one shall be permitted to sell products named in the bill, unless he has the ability to deliver at the expiration of the contract. In order to regulate short selling, it was found necessary to impose a more nominal tax on all sales. The bill includes raw or unmanufactured cotton, hops, flour, wheat, corn, oats, rye, barley, pork, lard, bacon, dry and salted meat or pickled meat. A tax of 1 cent upon every thousand bushels of wheat, corn, rye, oats and barley is imposed, and upon every thousand of raw unmanufactured cotton, hops, pork, lard, bacon, dry or salted meat and pickled meat; a tax of 3 cents upon every bushel of wheat, and of 2 cents upon every bushel of corn, rye, oats and barley. Provision is made in the bill exempting the dealer from the payment of this tax provided the property may be destroyed in transit by fire or by any unavoidable means. If, however, the party is detected in the act of evading the law by any fraudulent means he is made subject not only to the payment of the tax, but is also liable to a fine not exceeding \$1,000 or punishment by imprisonment and confinement at hard labor not exceeding five years, or by both in discretion of the court. The same provisions as to the cancellation of stamps are mentioned as those in force generally in the internal revenue service."

Canadians have a substantial interest in the matter of wheat speculation in Chicago. On the authority of a Montreal journal we stated before in these columns that many thousands of dollars of Montreal money had been lost in the Chicago wheat pit, and the president of the Bank of Commerce, at the annual meeting, made the statement that millions of Canadian money had been lost by grain speculation last year.

BANKER WALKER ON THE TRANSPORTATION PROBLEM.

GENERAL Manager Walker, of the Bank of Commerce, in his annual address to the shareholders spoke as follows, touching wheat matters and the question of transportation, as affecting Canadian trade, past, present and future: The year has been, as we all know, particularly hard on our people in the North-west, in common with the districts in the United States where wheat growing is the leading feature in agriculture. A very low yield per acre and prices lower than ever before to a country depending mainly on grain means something uncomfortably near disaster, and there is no use in disguising the fact that in actual power to pay debts out of the current season's products, the farmers of the North-west were worse off during the past year than ever before. But it would be a mistake to conclude therefrom that the people of that part of Canada are doubtful as to their future.

In the course of their progress to material wealth our North-west provinces must expect the recurrences at intervals of such vicissitudes, and the question is, what are they to learn from the present experience? That they must raise everything for which there is a market other than wheat is clear, and in this they will only reap the experience of what were once great wheat-growing states in the United States, but which may have many years since passed the maximum of wheat acreage. That they must farm more within their own means, both as to capital and the employment of labor, seems clear, but they have in the past only displayed the same expansive tendencies of their fellow merchants, and as all people in new countries who have not yet got their financial bearings. Hereafter, both from lessened ability and greater dread of debt, there will be improvement. But while the experiments in mixed farming are being made and the dreary lessons of enforced economy are being learned, the fact remains that for years to come wheat must be the main item in what they have to sell, and if they have to face the opening up of indefinite area of new wheat lands in the Argentine and elsewhere, they may have a hard time of it for a while. But the Argentine has again collapsed financially, and its farmers are about to learn that fancy prices for wheat in worthless paper money with gold at a premium of 325, may be quite delusive as to the profits of wheat-growing. We are not yet prepared to believe that the rude agriculturist of the Argentine can in the long run raise wheat cheaper, having regard to quality, than the farmers of the North-west.

Thrift and the highest intelligence in wheat culture, combined with an energy unknown to the mixed races of South America, must give the victory to us, unless the question be entirely one of transportation. But doubtless, as with most of the world's products, the question is one of transportation. The Canadian Pacific Railway claims to carry as cheaply as possible, and in the present condition of railroad earnings this is probably true. But it is also true that railroads will year after year be forced to lower rates, and must somehow carry wheat to Europe at prices which will leave a living profit to the farmer over a series of years. The great transportation question, however, which is agitating many people in Canada and the United States, is the possibility of a better water transit. Can we not improve upon the Erie Canal as a means of getting to seaboard? Are we to see the foreign bound traffic of the upper lakes deported at Buffalo, or are we to try to secure that traffic, and, what is much more important, provide the necessary cheap transportation for our North-west province? We who are inexperienced in the practical aspect of such matters talk vaguely about widening and deepening the present canals, or about a new canal across Ontario, or of connecting French river and Lake Nipissing, and thus making a route by the Ottawa river.

For lack of information we do not know what should be done; we only know that something practical might be done. In such an emergency it seems clearly the duty of the Dominion Government to have surveys made and report on all the proposed routes, so that the people of Quebec, Ontario and the North-west provinces may at least be in a position to express an intelligent opinion on such a vital question. I am sure we are sufficiently free from local bias to hold up our hands for whatever route will accomplish the great end of being the cheapest from the west to the seaboard. If there are those who say we cannot afford the expenditure, the answer is that we do not know whether we can or not until an intelligent report is before us. If success in wheat growing is all important to the North-west, and if having overcome the terrors of frost, the barrier is transportation, we must in some way overcome it.

In the meantime let us remember that about 12,000,000 bushels of wheat and about 25,000 head of cattle was exported, and altogether the North-west realized about \$6,000,000 out of their products, which is not very bad return for such a small population.

Reports from forty-five districts show that the acreage under crop in the North-west is as large as last year, in some districts larger, and while rain is much more required in many places, prospects are quite good, and the general feeling is not at all one of discouragement.

In our own province there has been damage by rain on low lands and some replanting is necessary, but there is no reason to doubt that we will have about as good crops on the average as usual.

LOVE IN THE OLD BURR MILL.

By R. R. ELLIS.

I recall the first impressions
And remember ever will,
Of the valley and its waters,
And their music, and the thrill
Of a thought that comes unbidden
To my soul anent my will.
In that valley near the woodland,
'Neath the shadow of the hill,
Where the shadows briskly hastened
To the mill-dam near the mill;
There to miller ferns and lichens,
Copse and forest near the mill,
With its overshot for driving
That old-fashioned flouring mill—
That old sentiment-inspiring,
Water driven old burr mill

This the thought that came unbidden:
"Here my soul shall find its mate;
Here within this charming valley
I will find my love and fate;
Here beneath this cobwebbed ceiling,
Where I meet the work of life,
I will also meet the being
Who must be my spirit's wife."
Presto! Came the lovely maiden's
Shadow 'thwart the open door.
She beheld me busy sweeping
Dust from off that "dirty floor"—
Yes, she caught me really sweeping
Dust from off that old mill floor

Afterward beside the hopper,
Toll-dish in her hands so sweet;
Filled it full to running over
Of the golden, smooth-branned wheat,
Questioning, naively, "Do you ever
Stroke it down below the rim?"
And I answered, blushing, "Never!
That, sweet maid's an unknown sin."

But the work was done while toying
With the dish that measured toll.
Her bright eyes had sent their love-light
Swiftly to my waiting soul.
Thus the thought prophetic widened
To a life poem we revere,
Full of rapturous notes pathetic,
Loving, constant, pure, sincere.

AMERICAN MILLER.

It is said that "there is nothing like leather"—flour sacks are made in Mexico to a large extent from that material.

Officials of the German army and navy after exhaustive experiments have decided against the use of peanut flour for the troops and sailors or as horse food. No immediate health injuring symptoms were noticed, but the men showed an unconquerable dislike to the food.

Subscribe for the CANADIAN MILLER. \$1 per year.

THE NEWS.

CANADA.

—Beeton, Ont., is agitating for a flour mill.

—A new grist mill is to be erected at Hawkestone, Ont.

—Kelly & Co. contemplate increasing the capacity of their mill at Brandon, Man.

—The big Ogilvie flour mill at Winnipeg, is undergoing extensive improvements.

—F. M. Reissbury has purchased the flour and feed business of N. Gray, Brandon, Man.

—Star flour selling at St. John, N. B., at \$3.80 per barrel, retail, the cheapest ever known.

—Improvements to S. Luke's grist mill at Bradford, Ont., costing \$6,000, are contemplated.

—Messrs. Wilson, Moor & Co., have assumed control and will operate the flour mill at Orden, Man.

—The British Columbia Milling and Feed Co., New Westminster, B. C., have closed down their mill.

—The flour mill at Arden, Man., recently advertised for sale, has been purchased by W. H. Wilson.

—A new firm seeking patronage in Winnipeg is John Donohue & Co., dealers in flour, oatmeal, grain, etc.

—The site has been selected for a new flour mill at Virden, Man., and operations will be commenced at once.

—Batchelor & Quine, millers, New Westminster, B. C., reported sold out to Brackman & Ker Milling Co., Ltd.

—Graham & Killingsworth, custom millers, St. Thomas, Ont., have been succeeded by Killingsworth & McCuan.

—The steamer Amarnyha, which went ashore near Isle Ronde, opposite Montreal, contained 60,000 bushels of grain.

—The exhibit of grain from the Canadian Northwest gained the highest award, a gold medal at the California Mid-Winter Fair.

—Corry Bros' steam grist mills at Havelock, Ont., were burned the early part of last month. Loss \$6,000; insurance small.

—An exchange says that a dollar and a half will purchase as much store goods now as fifty bushels of oats would purchase twenty-five years ago.

—A new grist mill, to cost \$9,000, will shortly be erected in Listowel, Ont. Messrs. James Gray and W. G. Hay are among the promoters.

—Atkinson & Co.'s grain warehouse at Wapella, Man., was blown over by a severe windstorm a fortnight ago. Crops in the neighborhood were also damaged.

—A new grist mill has been erected at Norwich, Ont., by a joint stock company. It has a capacity of 200 barrels per day, and cost \$40,000 to build and equip.

—Wm. M. Smith, of the Pioneer Oatmeal Mill, Portage la Prairie, Man., has recently put in some of the latest improved machinery for the manufacture of oatmeal.

—The conditions attached to the offer of a bonus for the erection of a flour mill at Wawanessa, Man., are said to be such as are unlikely to secure the carrying out of the enterprise.

—Juliana Hainault and L. E. Dastous have purchased the mill and entire business of the Macfarlane Milling Co., of Sherbrooke, Que. The business will be continued under the same name.

—Messrs. Muir & Ross have commenced the erection of their new steam grist mill at Mattawa, Ont. The site chosen is on McConnell street, and the plans show quite an ornamental building.

—The Farmers' Institute of Napinka, Man., has passed a resolution asking the Canadian Pacific Railway to grant permission to load grain direct on cars instead of being compelled to ship through the elevator.

—The foundation for the new flouring mill at Prince Albert, Sask., has been completed, and the superstructure will be erected at once. It is hoped to have the mill fully equipped and ready for the new crop.

—The town of Edmonton, N. W. T., offers a splendid opening for the establishment of woollen and oatmeal mills. Persons desiring information address J. R. Turnbull, sec-treasurer, Edmonton Woolgrowers' Association.

—A miller named Neil D. McHaughton, at Port Covington, on the border line between Canada and the United States has been found guilty of smuggling oats and wheat from Canada, and has had to pay \$3,500 back duties.

—W. H. Meldrum has leased a large flour mill recently fitted up by the Peterboro' Milling Company, at Peterboro', Ont., and will take possession on the 1st of August. The mill is owned by the Auburn Woollen Company.

—About a fortnight ago Mr. W. W. Ogilvie exhibited on change at Montreal a stock of wheat headed out, received from Melita, Man. The crops in that vicinity are reported to be two weeks earlier than usual, and harvesting will commence about the 1st of August.

—Lequin & Co.'s flour mill at Farnham, Que., was destroyed by fire on the 16th of June. The machinery was completely destroyed, together with eight hundred bushels of wheat, besides other grain, contained in the mill. The loss is about \$11,000 and the insurance \$4,000.

—A by-law will be submitted to the ratepayers of Brandon, Man., authorizing the granting of a bonus of \$6,000, and exemption from taxes for ten years for the erection of a flour mill of 800 barrels capacity per day. It is said a United States company will accept the offer should the by-law carry.

—The flour mill of W. B. McAllister & Son, at Pembroke, Ont., was the scene of a disastrous fire on the 18th ultimo, by which the roller mill wing was completely destroyed. The building used as an elevator and crushing mill was also considerably damaged. The loss will be heavy, and is only partially covered by insurance. The firm also own a mill at Pakenhams, where orders are being filled as usual.

—The committee at Elkhorn, Man., which has been working to secure the erection of a 100 barrel mill at that place, now propose to reduce the capacity of the mill to 50 barrels per day, as it appears impossible to get a practical man to undertake to operate a 100 barrel mill. It is contended that a 100 barrel mill would not be large enough to compete profitably with the large concerns, while it would be too large for gristing purposes.

—The Union Bank of Canada recently brought suit against the Kingston and Montreal Forwarding Company to recover 13,518 bushels of grain, valued at \$18,600, which, it is claimed, was the undelivered balance of a larger quantity which the Forwarding Company were in possession of as carriers. The case was heard in Montreal. According to the evidence there was a deficiency of 10,362 bushels still owing by defendant to the Bank, and the Forwarding Company were condemned to deliver to the bank, within fifteen days, 6,676 bushels of grain, or in default thereof to pay \$6,676, about one-third of the sum for which suit was brought.

—The flour and grist mill recently erected at East Toronto has resumed operations, after having been closed a short time for want of coal. This mill is owned and operated by a Toronto company, Mr. S. G. Beatty being President, Mr. Chas. Builder, Secretary, and Mr. W. H. Compton, Manager. The edifice is of white brick, two stories, and cost about \$7,000. The fittings and machinery involved an outlay of about \$12,000. The plan of operation is the Case system of roller milling driven by a 45 horse-power Corliss engine. The capacity is seventy-five barrels per day. The basement contains the cleaning machinery, the line shaft and elevator boots. On the centre flat are four double sets of 9x18 Case roller mills, one Richmond separator, one double set 9x18 chopping mills and one single set with smooth rollers for crushing oats, several hopper and platform scales, four packers for bran, flour, etc. On the upper storey are four Inglis elevator reels, one Case scalper, one Inglis centrifugal reel, one bran and one shorts duster, two Inglis purifiers, and the heads of the shafting and elevators. The mill is in charge of an experienced miller, Mr. E. J. Compton.

GENERAL.

—A despatch from Chicago states that good apples are held at \$50 per barrel. As there are about 400 apples in a barrel, the price would be 12½ cents each.

—Bradstreet's estimates that there will be 140,000,000 bushels of wheat available for export from the United States for the year ending July 1, 1895. This is much less than the exports for this or the preceding two years.

PERSONAL.

The death is announced of Mr. Archibald Campbell, an extensive grain dealer and ship owner of Lockport, Ont.

Miss Mcighan, daughter of Mr. Robert Meighan, President of the Lake of the Woods Milling Company, Montreal, was married on the 12th ultimo.

Mr. W. W. Ogilvie, president of the Montreal Board of Trade, and family, have taken possession of their magnificent summer residence on the Lower Lachine road, recently completed.

Mr. John Brown, of the Citizens Milling Co., Toronto, is an enthusiastic wheelman. He is credited with having recently made the trip from Toronto to Oshawa—34 miles—in two hours and 40 minutes, carrying with him his little daughter, who weighs 34 pounds.

The marriage of Miss Maggie McDonald, eldest daughter of Mr. J. P. McDonald, President of the North American Mill Building Company, of Stratford, Ont., to Mr. W. A. Rutherford, of Toronto, was celebrated in that city on the 6th of June. The newly married couple will reside in Toronto.

Mr. Charles H. Fairweather, of the firm of Hall and Fairweather, wholesale flour and provision merchants, St. John, N. B., died on the 12th of June. He was one of the most influential business men of the city, and was at one time President of the Dominion Board of Trade. The firm with which he was connected had continued with the same name partners for over 40 years.

ENGINE AND BOILER FOUNDATIONS.

THE depth of engine foundations should be at least six feet, says a contributor to the Boston Journal of Commerce, unless there is a good rock bottom before reaching this depth, so that the engine anchor bolts may be anchored directly into the rock; otherwise, if there is no such rock to anchor to, and the above depth has not been made, there will not be enough weight to the foundation to hold the engine down. The writer is well aware of the fact that there are engines on the market today where great care and attention has been given thoroughly to counterbalance the engine, so that the engine will run steadily and smoothly, set upon four pins, and will not jar or shake off the pins, the engine not being bolted to the foundation. The above is all right so far as it goes, but will not answer for large engines, and especially when the engine is very heavily loaded. The length of the foundation on the shaft end of the bed, measured from the centre of the shaft to the end of the foundation, should be equal to the length of the foundation measured from the cylinder end of the bed to the centre of the shaft. The correct proportion of this foundation is about seven and one-half times the stroke of the engine. In a great many places this length of foundation on the shaft end of bed has been very much diminished. There is no better place to throw in a brick on an engine foundation than on the shaft end; here is where the weight is required.

The above dimensions which have been given will make the ends of the foundation equally divided on each side of the centre of the shaft in the centre of the apex of the foundation. The width of the foundation at the bottom should be equal to eight strokes of the engine. In the case of an engine 12-inch stroke this would be 96 inches.

Concerning the boiler foundations, T. F. Scheffler tells the American Society of Mechanical Engineers that his experience has found a depth of 3 feet below the floor line to be sufficient. A good, hard sandstone will give good results when brick is not used, which some people prefer. The width of the foundation should be 6 inches more on the floor line than the boiler side walls, which should be 24 inches for a boiler above 5 feet diameter. There has been considerable argument about the best height from the floor line to the fire-door opening; 22 to 24 inches is a satisfactory height, but 30 inches is considered a much more satisfactory and better height for the ordinary fireman, and in many instances where the fronts themselves do not permit of this height it has been obtained by raising them 6 inches or more above the floor line, and has been given good satisfaction. Another point that is debatable is the height from the bridge wall to the boiler. For 66-inch boiler 12 inches is a good height, as this gives an area between the bridge and shell largely in excess of the boiler-tube area. Another point of consideration is the distance of the grate from boiler, which this writer gives as 26 inches for a 66-inch boiler burning soft coal, and this height he finds has proven very satisfactory. Such a height will evaporate more water than 30 inches.

Does boiler inspection pay? North Dakota has been experimenting with the question in a practical way, trying one year with, the next without. The year the inspection law was in force it got through the threshing season without a single explosion. The bill was then repealed, and the season just closed has witnessed seven explosions and seventeen fatalities. If human life is worth anything in Dakota, the inspection pays.—Power.

THE WHITE LOAF AND THE BROWN.*

WE now come to the finished article we are all so familiar with—loaf bread. It was a Frenchman who once said that if he had the luxuries of life he could dispense with the necessities. I daresay there are a great many people besides this Frenchman who would be inclined to say the same thing. But I question very much if it would be for the good of the body, or the soul even, of anyone who was able and did carry such a thing into actual practice. No, it is the universal experience of all that plain good food is by far the best, not only where the immediate sustenance of the body is concerned, but in every instance where health and long life are looked upon as the *summum bonum* of our physical nature.

In childhood and in youth we prefer the luxuries, craving the fancy breads. But as time wears on, and a few years pass over our heads and we gain some little experience of life and living, our tastes for these fine things begin to wear off and go in for fine breads—French and Vienna breads. A few years more over our heads and we finally settle down to the good old plain loaf, common or fine, first or second quality, according to the size of our purse or our ideas as to the economy of using the common or fine types of loaf bread.

The first question that naturally occurs to us to ask is, why is wheat selected for the flour for loaf bread baking in preference to all other grains? Simply because it is the only grain which possesses in sufficient quantity, and of the proper quality, that material called gluten, which has the peculiar property of making a light and spongy loaf; not only agreeable to look at, but pleasant to the taste, easily digested, and nourishing to the body.

Wheat flour, then, is the principal ingredient in the manufacture of loaf bread. The other ingredients are salt and yeast. The yeast used may be what is called distiller's, brewer's or Parisian barm. From these in proper proportion, and used in the proper way, is turned out the finished staff of life.

A very few people, well-meaning in their way, calling themselves vegetarians, never cease to rail against the white loaf. Many diseases that humanity suffers are by them traced to the white loaf, and these diseases they say are increasing since roller milling has put into the hands of the baker an article which enables him to turn out a loaf finer and whiter than ever. To this I reply that flour made by the roller system is whiter because it is cleaner, purer, freed from all dirt that used to be ground up with the wheat on the old stone system; not because, as these people erroneously suppose, all the nutriment is ground out of it by rollers, and nothing left but pure white starch. If these detractors of the white loaf would devote a little time and study to the matter, they would find that it is not in the manufacturing of the flour or baking of the bread that any fault lies, but in the way in which the bread is consumed—or rather I should say the stage at which bread is eaten. White-loaf bread should not be eaten until it is at least 24 hours old. New bread is not easily digested; stale bread is, and is more nourishing than new; properly toasted bread is more easily digested, and more nourishing than either new or stale. And to those interested in teetotalism it might be remarked that the stale bread contains less alcohol. The reason that stale bread is more easily digested, and therefore more nourishing than new, and toast more so than either, is not far to seek. Leaving water out of account, starch forms about 65 per cent. of the weight of bread. The proper digestion of starch depends upon the thorough chewing and the perfect mixing of the starch with the spittle or saliva in the mouth. Now bread is soft, full of moisture and forms into a smooth, doughy lump immediately it enters the mouth. In this state it is impossible to mix it thoroughly with saliva. Indeed, no one who eats bread in this state thinks of doing so, as it is felt to be in that state which favors the easy slipping over the throat without any particular chewing. Hence it enters the stomach in a state not only unfit for doing any good, but with the chance of doing positive injury. Stale bread, and toasted bread particularly, has lost a considerable proportion of its moisture, and feels drier; it consequently demands more mastication. It thus gets

the proper mixing with the saliva on which depend the thorough digestion of, and extraction of nourishment from, all starchy foods.

The use of brown bread is increasing and we think rightly so. It makes a good mixture and variety. But we would here put forward a word of caution to those who use it, and that is, that brown bread made from a mixture of white flour and bran should on no account be used. In fact I would even advise carefulness in the use of bread made from ordinary whole meal unless for very special reasons, and unless it was known for certain that the whole meal used was made from specially selected wheats and great care exercised in the grinding. By far the best, and that which in itself most nearly approximates to a most perfect food, is the loaf made from a pure wheat meal from which have been carefully extracted the broad particles of bran. Broad bran ought not to be eaten. It is simply a woody fibre, is of no value whatever as a food, and in the human system may, and often does, cause unnecessary irritation and trouble.

JAPANESE CEREAL CROPS FOR 1894.

IN its ninth annual report, just issued, the Japanese Department of Agriculture and Commerce has made an estimate of area, yield, and total production of the principal cereal crops of the Empire. The most important cereal crops of Japan next to rice are barley, naked barley (*hordeum nudum*), and wheat. Barley is cultivated in almost all provinces, and, either as flour or whole grain, boiled with varying quantities of rice, is used as common food, both by farmers and other classes of people in Japan. For this purpose it is whitened like pearl barley, steeped for five or six hours in water and then boiled. One of the most common articles of food in Japan is miso, which is prepared by pounding together boiled soy beans, salt, and the koji (yeast) prepared from common barley or naked barley. Barley is also used for brewing beer, making ame and other confectioneries, and as food for horses and cattle. Its straw, bleached and plaited, is much used for manufacturing summer hats and other articles. Naked barley, is almost as important a cereal as ordinary barley, and the area devoted to its cultivation is nearly as large as that under ordinary barley; but it is chiefly grown in the western and Southern provinces. It is used for the same purpose as common barley. Wheat is cultivated in nearly all the provinces. It is simply used for preparing soy, vermicelli, onmen, undon, and several kinds of confectionery.

For preparing onmen (a kind of vermicelli), wheat flour is made into dough with salt water and then drawn out into fine threads which are cut into certain lengths. The only difference between onmen and common vermicelli is that no oil is used in the preparation of the former. For preparing undon (a kind of macaroni) 10 parts of wheat flour and 3 parts of potato starch are kneaded by hand with a certain quantity of brine, then rolled out into thin sheets, folded into layers, which are cut into fine threads and dried by the sun. Wheat straw is used for thatching roofs, litters, etc. A small quantity of both barley and wheat is annually exported to foreign countries, the former chiefly to Hongkong and Vladivostok, and the latter in the form of flour to Russia, Corea, etc., and in the form of grain to Hongkong, England, etc.

The manufacture of straw plaits and other straw goods for bleached barley stalks is assuming large portions in Japan. Some farmers bleach the straw of the barley which they have grown in the intermissions between field work and sell it to the plait manufacturers; but they generally, after harvesting and thrashing the barley, cut the upper part of the straw to the length of about a foot and sell it to the straw plaiters. Although Japanese straw is not so good as that of Italy, yet it is better quality than that of China and other countries. In Japan, articles of straw, especially toys, have been made for many centuries; but recently, on account of the increasing exportation of straw plaits, to foreign countries and especially to the United States, the manufacture of plaits has increased year by year.

The total area in cereals is, in round numbers, 1,774,000, square *cho*, or 4,274,000 acres. Of this, 1,042,900 acres, or about one-fourth, is devoted to wheat, and produces 3,218,678 kokou, or 16,477,370 bushels; an average of 7.56 koku, or 15.8 bushels to the acre.

THE EFFECT OF ABRASION.

THE shortest route from the wheat kernel to the flour barrel, writes Wm. G. Clark, in the American Miller, is certainly the best, providing the proper manipulation is carried out. The long handling and friction of stock in elevators, conveyors and sprouts will have the effect of pulverizing a certain percentage of the impurities in the flour, and reducing a small percentage of the flour granules into an impalpable dust.

It has been demonstrated by baking tests that flour with the natural sized granules preserved will make a stronger and longer loaf of bread, and will take more water and better suit the bakers' trade. How small these granules can be reduced and still not injure their water-absorbing qualities, I cannot say definitely; but I think that those will pass through a No. 14XX cloth are as small as can be depended upon to make strong bread of a quality that will suit the trade in general. In making bread the finest particles of flour will absorb the water quicker than the coarser particles; consequently, the fermentation will have gone further in the smaller atoms while in the sponge and cause an uneven working of the dough throughout the process of breadmaking. I claim, therefore, that the impalpable dust that would sift through the finest cloth made is a detriment to good flour, and that the effects of the injury will be in proportion to the amount of such dust present.

Again, when the cellular formation of the flour granules is broken, as in finely pulverized dust, the carbonic acid gas, which is formed by fermentation, cannot be retained or its benefits utilized with as good results, as these minute cells, where the carbonic acid gas performs its function of the raising of the dough, are broken. It will be plainly seen what the effect will be.

A better idea of the granular particles which make up flour can be obtained by examining some flour under a strong magnifying glass. It will be observed that the flour in general appearance resembles glistening salt or snow, and appears as if it could be easily reduced still finer by rubbing it between thumb and fingers, which is the case. The writer has taken coarse middlings and reduced it into flour in this manner. The particles are tender, and for this reason, the less abrasion or handling before purifying or grinding the better the results. This is one reason why the leading mills of the Northwest, which mill entirely for middlings, dispensed with conveyors under their purifiers and grading reels.

It is an undisputed fact that the conveyor is the most objectionable of all mechanisms handling material in a mill. It takes up valuable space and power, and should not be used where elevators and direct spouting can be adopted. However, on wheat the conveyor is not so bad. It does some good in helping to scour the grain, and it makes a good mixer; but in handling flour products it is a detriment to highest results. I think that a conveyor six feet long will do no more damage to stock than an elevator ten times the length. The conveyor is like a wagon without any wheels; it drags the stock along and wears it out.

Next to the conveyor I consider the abrasion of stock in long spouts more injurious than elevators. I think there is a field for a good belt carrier to take the place of the conveyor. A mill built with high floors, where conveyors can be dispensed with will in the future meet with the approval of advanced millers. I do not look for a radical change in the construction or plans of mill building, but there will be some changes made. In the arrangement of break rolls and scaplers, the objective point will be to avoid handling and abrasion of break stock.

The break stock being the starting point, and the nature of this stock having bran, middlings and flour present, it is, in my mind, the most important place to avoid abrasion. The result will be cleaner chop and better middlings, and the after separations will be made more perfectly, the result being better flour. The Hungarian flours, I am informed, are made without the use of an elevator or conveyor, all the handling being done by hand. This, of course, would never do for progressive America: but the nearer we can manufacture flour after this principle by the use of machinery the better class of flour can be made.

The earliest fanning mill or winnowing machine was invented in China, and in use there for centuries.

*Part of a Lecture delivered at Dundee, Scotland, before the Dundee Institute of Mechanical Engineers, by William G. Anderson, Manager of the Dundee Flour Mills.

STEAM BOILER INSURANCE.

By W. H. WAKEMAN, IN *CASSIER'S MAGAZINE*.

WHEN the writer was a small boy he heard someone speak of getting his life insured, and if it were possible to do this we wondered why it was that everybody did not take out a policy at once. This thought was due to a mistaken idea as to the meaning of the term "life insurance," for we thought that if a man had his life insured he would never die. In due course of time we learned that it was no guarantee of long life at all, but meant only that when a person, whose life was insured, died, his or her heirs would receive a certain sum of money. This made the matter appear in an entirely different light and we were not so enthusiastic as before; but when we became old enough to fully understand the matter we saw that it had its advantages and at the present time we heartily believe in life insurance.

We also believe in steam boiler insurance. In some respects they are alike. If a man wants to have his life insured, he makes application to some company who are engaged in that business, and is sent to the physician whose duty it is to examine applicants. The physician orders the candidate to do certain things, in order that he may know whether it is safe to issue a policy to him or not. He thumps and pounds him in different places, asks him to take long breaths, measures the expansion of his chest, listens for any sound that indicates weakness of the vital organs and makes his report accordingly. If it is favorable, the policy is issued, and generally no further attention is paid to the policyholder, except to see that his premiums are promptly paid, and, when he dies, to pay the insurance money according to agreement.

When a man wants to get a steam boiler insured, he also makes application for a policy to a company in that line of business. The company sends one of its inspectors to examine the boiler and ascertain if it is a good risk. This inspector strips the boiler and examines every part of it. He thumps and hammers it with his small steel hammer, and listens carefully for any sound that will inform him whether any of its vital parts are weak or decayed; he sounds every sheet, head and brace, and tays every rivet that he can reach to see if it is loose. If he finds any defect, orders it made good before the policy can be issued. If he is in doubt about any part that he cannot reach with the hammer, he may apply the hydrostatic test to satisfy himself that it is more than strong enough to withstand any ordinary steam pressure. Up to this point boiler insurance is very much like life insurance. But the boiler is not allowed to go without further notice when the insurance premium is paid over. The insurance company make periodical inspections of it, and note how it is cared for and managed. If any defects are found, they must be remedied at once or else the policy will be canceled. They make a point of claiming to prevent boiler explosions to a large extent; hence, if a boiler does explode while under their care, it not only costs them a good sum of money, but it injures their reputation, and thus proves a damage in two ways. Therefore, they have two objects in view when they strive to prevent boiler explosions, each one of which is enough to cause them to exercise care in placing and continuing a policy in force. It is the prevention which manufacturers and steam users prize and pay fully as much for as the idea of getting their money when an explosion does take place.

If a man dies, no one thinks of blaming the company that issued a policy of insurance on his life, for the way in which he died; but if a boiler explodes, the insurance company that was interested in it is looked on with suspicion at once. True, some of the defects in boilers are very difficult to discover, especially where the tatter are nearly full of tubes below the water line, but every boiler that does explode, shows that by a careful and thorough examination of every part of it, the defect might have been discovered in time to prevent the catastrophe. It is quite possible that some of these defects might have been brought into existence between two inspections, but it is also true that inspectors are not afforded all of the chance that they should have to examine every part of the structure. Even if it does become necessary to remove some bricks for this purpose it should be cheerfully done, as the result of it may mean much to all parties concerned. It cannot be denied that risks are sometimes taken in cases which are not wholly satisfactory, for competition in this line of business has its effects just as it has in other lines, and a company will take some risk rather than let business go to a competitor.

In a certain case, well known to the writer, the inspector wished to have some bricks removed from a top of a boiler so that it could be determined whether the iron had been weakened by external corrosion or not. The case was stated to the proprietor in a respectful manner, but he flew into a rage at once, and told the inspector that if he could not insure the boiler just as it stood, he might "get out" without delay. Both inspector and engineer might have taken the advice so vigorously given, but as neither of them knew that the plates were corroded on the outside, and as both of them knew that

they were perfectly sound so far as could be judged from the inside, they went quietly about their business. The engineer removed the bricks in question, affording access to the top of the boiler and put them back himself. He lost no time, however, in looking up another situation. In this case there was no real danger, but no one could say positively that none existed; still if danger had been imminent the action of the proprietor would have been the same, for he knew nothing of the condition of the boiler.

Proprietor, inspector and engineer should all work together in striving to get at the true state of affairs, for all are interested. There was a time when boilers could be insured with some companies just as houses are, but experience has been a wise teacher, and few are now insured without careful inspection. There is no doubt that the periodical visits of the inspector act as a check on the careless and incompetent engineer. Unfortunately, however, they do not always change him into a competent and reliable person. Cases are known where the gauge cocks were carefully cleaned out just before each one of these visits were made, and after the inspector had satisfied himself that they were in good order, they were not disturbed until it was nearly time for another visit.

It is claimed by some that the practice of having boilers inspected and insured, has resulted in lowering the wages of engineers, for, with the inspector making visits every three months, a cheaper man will answer every purpose in the estimation of steam users. This, however, is probably not true to any extent, for while it may be spoken of as an excuse for lowering wages, it is apt to be done only by those who intend to reduce wages any way, and think this to be a good excuse to give for "penny wise pound foolish" policy. It is a notable fact that where the highest are paid to engineers, and where the best service is rendered in return, the boilers are generally insured. A sensible manager will always hire a good engineer and pay him fair wages, and a foolish one will hire the one that will work for the smallest amount of money. The boiler insurance problem has little effect in either case under any conditions, and usually none at all.

Steam users who have never had their boilers insured and who contemplate trying the experiment, are naturally anxious to know whether the insurance company will require them to employ a more competent man to run their boilers or not. To this it may be replied that if a man will keep sober and make every reasonable effort to give satisfaction with his work, the insurance company will offer no objection to him. Their leniency in this respect is, in fact, sometimes to be wondered at. Cases are known well to the writer where it would have been perfectly justifiable for the company to cancel the policy unless the boiler attendant was removed, because he persisted in practices that were positively dangerous. Very little trouble, however, was encountered in these instances, for the insurance company would send their inspectors around to visit such a place at frequent intervals, ostensibly for some purpose, but in reality to observe the proceedings of the suspicious man, and to remonstrate with him, and impart information as to better methods to pursue, the object being to remove the objectionable practices without depriving the perpetrator of his situation. Inspectors while going from place to place, gain much information concerning the behavior of boilers under different conditions, and the result of experiments made to determine various problems of interest to engineers and this information is always at the disposal of men who operate plants where the insurance company is interested, since obviously it is to their interest to have men who thoroughly understand their business in charge of boilers on which they carry risks.

The publication of data regarding boiler explosions in a systematic manner, as practiced by some of the insurance companies, is to be commended, but it seems as if the publication of lists of so-called defects were at times misleading, or at least of little value. Take for illustration, a report that during a single month 149 broken and loose braces and stays were discovered, and that of this number thirty cases were dangerous. The writer is of the opinion that if 149 braces were loose or broken, then 149 were dangerous, and if 149 were not dangerous then they could not be either loose or broken. All braces are supposed to be in a boiler for a certain purpose, and how can they act in the way that was intended if they are either loose or broken? We are told in another case, that 291 plates were found to be fractured, but only 43 were dangerous. If a boiler plate is really fractured, is it not dangerous? If it is not dangerous, then why is it reported? Of defective riveting 1228 cases were found, but only 66 were reported as dangerous; 328 defective water gauges were found, with only 84 reported as dangerous. The writer has always supposed that if a water gauge was not defective it would show a true water level. It cannot be imagined how a water gauge can ever be defective, and still not be in a dangerous condition. If 59 safety valves were found to be of defective condition, it seems strange that but 19 of them were dangerous; 476 pressure gauges were defective, out of which 42 were dangerous. This latter is easily

understood, for while a gauge which indicated more pressure than really exists in the boiler is defective, it cannot be said to be dangerous.

While writing, one of several points worth noting in connection with boiler inspection suggest itself. An inspector, for example, comes to a plant, examines a battery of boilers, and tells the engineer what defects he finds, making suggestions as to what might be done for the improvement of the plant, orders some changes and takes his departure, leaving with the engineer no written report of what he finds and wants. The engineer proceeds to make such changes and renewals as he understands will be satisfactory to the inspector, the boilers are put together, filled with water, fired up and the plant is started. About three weeks afterward, a written report is sent to the office telling what the inspection revealed, and what repairs are needed. When this is referred to the engineer, he discovers that there apparently was not a perfect understanding between the inspector and himself, the report calling for things that have not been done, although there was a desire on the engineer to do all that was required. Such possibilities should be guarded against at once. All that the inspector has to do is to leave a written report with the engineer at the time the inspection is made. There can be no chance of misunderstandings.

A certain inspector came to examine some boilers at a plant where his company was interested, but found that the engineer was not quite ready for him, not yet having washed out the boilers. He started to do this at once, but the inspector objected as he claimed if a stream of water was turned into them they would be wet, and it would be unpleasant work for them. The engineer, therefore, allowed them to remain as they were but was much chagrined two or three weeks later when the report came, that the boilers were in good condition, except that they needed a good washing out. Ever since then no inspector goes into those boilers until they are washed out, without regard to polite requests made to let them remain as they are.

Concerning the recommendation of certain methods for future use in caring for boilers, the inspector should be discreet and careful, for no universal rule will answer the purpose. This is due not only to the fact that different waters are used for making steam in different localities, but also because the inspector cannot know all of the conditions found in every day practice. Usually he does not recommend any patent preparation for the prevention and removal of scale, etc., but favors the use of soda ash, crude petroleum, or something similar. But suppose that an engineer has used soda ash, for example, and found it unsatisfactory for some reason or other. He succeeds in discounting its use by showing his employer that he has good reasons for rejecting it, and secures something else that does good work and is not objectionable. The inspector comes in due time, looks boiler over, and goes away. When the report of the inspector is received, the engineer is disgusted to find that soda ash is recommended to prevent scale. Of course the engineer has to go all over the matter again with his employers, and of course he gains his point, and the soda ash is not used; still it has been the cause of much talk and some unpleasantness, both of which were unnecessary. It is better for the inspector to ask what has been used in the past, and if the article is not positively objectionable to him, let him recommend a continuance of it, or let both engineer and inspector agree on something to be recommended, and thus prevent unnecessary conflict.

A wheat pest has appeared in parts of Pennsylvania in the shape of a small green bug or louse, which it is feared is sapping the heads of the growing grain.



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FOREIGN WHEATS IN ENGLAND.

COMMENTING on the qualities of various foreign wheats used in England, "Felix Holt" says in Liverpool, England, Milling: From America to India is a far cry; from American to Indian wheat is a great descent. It would be untrue to say that American wheat is all better than Indian, or that all Indian is worse than American. Both have virtues, but those possessed by Indian are very subdued in comparison with the American. We are getting wiser with regard to wheat, and from experience we have learned that Indian wheat fills a useful function in combination with other wheats. Owing to its unprepossessing appearance this wheat has been degraded to a lower position than it legitimately deserves. Whatever may be said about it, and whatever faults it may have, it is at least honest. Some wheats are very deceptive; notably, common Azimas, some Plates, also, some western winters, with a few others, less known, but Indian wheat may generally be relied on so far as its particular characteristics are concerned.

The principal feature of Indian wheats is dryness, containing, as they do, only about eight per cent. of moisture. They are deficient in gluten, but what gluten there is is very sound and reliable. They are what are called starchy wheats, and, containing good sound, dry starch, they fulfill a useful part when mixed with weak, watery wheats, such as damp English or poor, watery Russians. When properly cleaned by washing, Indian wheat produces flour of no mean color, which will compare very favorably with that from far more expensive and pretentious wheats. Good Bombay is without doubt one of the very whitest wheats grown and, by reason of its dryness, combined with a moderate quantity of gluten, will make a fair showing in bread; but, of course, its best application is in giving color to strong wheat. Delhi wheat is very useful and comes somewhat near Bombay, except that in some cases it contains an admixture of red earth or baked clay, which is exceedingly difficult to deal with. The red variety is fine, bold wheat and fairly strong, but the strongest of these wheats is considered to be Calcutta, which is scarcely so good a color. The Kurrachees, both red and white, are very useful, although generally very foul and dirty. Of the two I give preference to the red, being, perhaps rather stronger and an equally good color when clean.

As mentioned above, Indian wheat is honest. No one would expect to get flour from Kurrachee wheat equal to that from American springs, and so would not attempt it. They might try to get strong flour from some kinds of Russian and be woefully disappointed. Some millers use large quantities, with very satisfactory results, and these, by no means, small millers. A great drawback is the very large quantity of dirt and extraneous matter mixed with it, which tends materially to enhance its cost. This season it is exceptionally foul, which may possibly be accounted for by the low price prevailing, the grower or dealer presumably, attempting to improve his price by increasing his bulk. Whether or not this is generally done, I had it from an old Indian civil engineer that he had actually seen dirt mixed with wheat to increase its weight. Some of the dirt is attributable, no doubt, to weevils. These little insects bore into the grain, releasing a portion of flour, which, mixing with the accompanying dirt apparently, swells its bulk, although in reality it is not dirt at all, but flour granules made dirty.

Whatever may be the future of Indian wheat, there is no doubt that it will always be useful and always be welcome to a great many British millers. There is nothing exactly like it, and nothing will exactly fill its place, although in some respects certain varieties of River Plate bears a slight resemblance, that is in dry granular starchiness, but perhaps a closer resemblance to it by its near neighbor, Persian wheat. This is sometimes atrociously foul, being credited with 15 per cent. of barley admixture. This is, however, rather stronger than the Indian varieties, being, probably, grown upon more elevated land. A near neighbor is Syrian, a wheat with very little to recommend it, but its fair appearance might lead a novice into serious difficulties, in which respect it greatly differs from honest Indian. A somewhat similar wheat is Egyptian, but far superior. This comes somewhere between Indian and Syrian. It has a tolerably fair color, but very little strength, and may prove

somewhat dangerous in inexperienced hands. It is exceedingly hard, and washing does not appear materially to soften it or render it easier to reduce with rolls. On this account it may prove dear wheat, although bought at low prices.

The greater portion of Egyptian wheat imported into this country is used for sizing, for which purpose it seems peculiarly adapted, as many wheats are quite unsuitable. All clear wheats, such as Egyptian, Syrian and hard Chilian, seem to come in well for this purpose, but one and all are best left out of any flour-making mixture. There may be some inducement to use the best of them when other wheats are scarce and dear; at the present time there is no need to touch them for flour-making. This warning may appear superfluous to experienced millers, but there are some who, to my knowledge, have been woefully deceived by the fair appearance and comparatively low price of some of these wheats. We may take it as a safe rule that price invariably bears a close relation to quality. If we judiciously buy good wheat, we can scarcely fail to get good flour, but whenever we descend to low-priced stuff, depend upon it, we are on dangerous ground. There is a common saying that "high interest means poor security." Even so any attempt at high profit is a trifling with security. We may, if we are clear, succeed for a season on low-class wheats, but retribution will surely overtake us, for low-quality wheat is sure to be variable. Variableness in high-quality wheat is not particularly felt, as there is a good margin for possible declension, but variableness in that which at best is scarcely good enough, must surely bring us into trouble sooner or later. As a matter of fact, mills using low-priced wheat are the very mills that have a reputation for variableness, but let us say, in a whisper, they sometimes manage to return a good profit. Use some low-priced wheat, but also use something thoroughly reliable, so that the inevitable variation is neutralized, if not entirely overcome. Of all low-priced wheats, I know none so useful and reliable as the Indians. That is, of course, so far as their particular qualities are concerned, dryness and fair color.

ONTARIO CROPS.

THE latest report of the Ontario Bureau of Industries, bringing conditions up to June 15, says:

Fall Wheat.—This crop has stood the heavy rain and changes of weather much better than the spring crops. Throughout the entire province some low lands have been flooded, and the crop drowned out. On very heavy clays there has been some damage, but on light and loam soils very little injury has resulted. The reports for this time of the year are quite up to the average. The frost of the first week of June was felt to a very slight extent. The reports from all parts of the province are practically the same—that after the rain the wheat soon picked up and showed less injury than had been supposed. No more than usual has been ploughed up and resown to spring grain. Heading out was in progress on the 15th. In some places the growth was quite rank. With favorable weather for the next three weeks a good crop of fall wheat may be looked for. At present the conditions promise an average yield. In the Lake Erie district the crop was fair to very good except on low lands and a very heavy clay. Damage by frost was very slight. In the Lake Huron district most of the reports are for a good crop. Some attention is given by correspondents to the benefits of drainage, which were very apparent during the present season. In the Georgian Bay counties a small fraction of the crop has been lost, but on the whole it is quite up to the average. In the West Midland group the best reports come from Wellington, and the worst from Middlesex, where, however, the crop is reported fair. Along Lake Ontario the reports are also favourable for a fair crop—fully up to the average. In the Eastern Counties the amount of fall wheat is too small to affect the total, but reports are favourable. To sum up, the present condition is fair, with prospects of a crop quite up to, if not a little over, the average, with favourable weather.

Spring Wheat.—As usual there is but little spring wheat in the western part of the province, while in the eastern half the acreage is declining. The low-lying lands have suffered severely, but the higher lands have fair crops. The grain was sown in fine condition and is

now recovering rapidly from the extra rain. In many places correspondents state that the rain did more good than harm. In the Eastern Counties about one-third of the spring wheat is either destroyed or is in poor condition; two-thirds may be said to be fair to good. Less than usual has been sown in the Northern districts. On the whole, present indications are for a crop about two-thirds of the average.

Barley.—In the Lake Erie district only a moderate quantity has been sown, and the condition is under the average. It has suffered from rain and also from frost. In the Lake Huron district barley is not in so good a form as spring wheat; it is backward and a little yellow in places, but is now improving. In the Georgian Bay district rain and frost did some injury, but an improvement has taken place since warm weather returned. In the West Midland district the crop is reported as being uneven or patchy and backward. In the Lake Ontario district the condition is a little under the average. In the St. Lawrence and Ottawa district the condition is reported as more favourable, and with good weather a fair crop will be obtained. In the East Midland district the crop is fair. In the Northern districts nothing of any consequence is reported. On the whole it may be concluded that the barley has suffered quite extensively, is backward in growth, but at present is making very rapid progress, and with a continuance of favourable weather, will probably come up to nearly the average of the last two years.

Oats.—The reports from every section of the province are practically the same, and to the following effect:—The rains drowned out the crop on low-lying fields. On higher lands and those underdrained little or no damage was done. At the time of reporting the crop was making a very rapid growth, and becoming somewhat rank in straw. A few fields were baked by the hot sun, but on the whole the prospects were most promising, the only unfavourable report being as to the low lands. The crop is on the whole somewhat more backward than usual, but present conditions point to a yield fully up to the average.

Rye.—There appears to be less and less of this crop sown every year. As far as reported upon it came through the winter in good condition, was favourably affected by the continued rains, and now is in excellent condition, having made a very heavy growth.

Peas.—The continued rains did more damage to this crop than to the other spring sown crops. Early sown peas have done well on high lands, but on low lands have suffered heavily. The rains retarded sowing, so that a large acreage has been put in late. As a consequence the yield will be a little short in quantity, but at present the quality of the crop is in general all that could be desired. The reports from the largest pea counties of the west are quite favourable.

Corn.—In the south-west a considerable quantity had been planted before the rain came, and much of it had to be replanted. The crop over the province is backward, growth being checked by cool weather. The condition at present is hardly up to the average. The late start may interfere with the maturing of the southern ensilage variety. Many report the young crop as not looking very thrifty. From all parts of the province come reports of replanting, of late planting, and of slow growth. Prospects are for a crop a little under the average in quantity.

Buckwheat.—Two-thirds of this crop is grown in the Lake Ontario and the St. Lawrence and Ottawa groups. Very little had been sown before the rains came on. At the same time of writing farmers were just putting in their crops. The only report possible at this time is that quite an extensive acreage will be grown this year.

Beans.—Early planted beans, especially in gardens, were cut off by late frosts. Most of the crop has been put in late. The acreage will therefore probably be below the average. While many report that the crop is now coming on well, the general opinion is that the early frosts and the lateness of planting will cause a diminished yield for this year.

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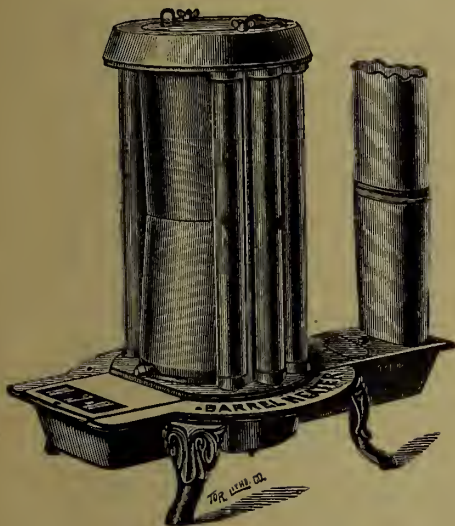
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OLD SERIES, VOL. XI. } NUMBER 8.
NEW SERIES, VOL. IV. }

TORONTO, ONT., AUGUST, 1894

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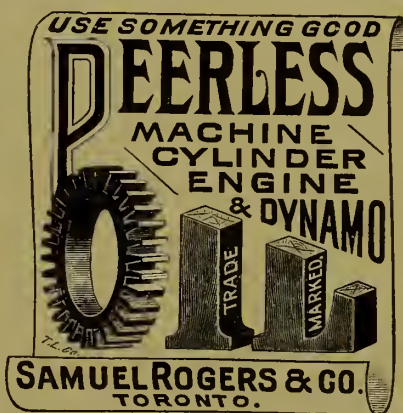
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There are two Store Houses at the railway station, which will go with the mill if the purchaser so desires, and tenders may or may not include these.

The property is offered for sale in consequence of the decease of the late proprietor, Mr. A. McFall.

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OLD SERIES, VOL. XI. } NUMBER 2.
NEW SERIES, VOL. IV. }

TORONTO, ONT., AUGUST, 1894

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BY THE WAY.

GIVING space to the news item that Canada is shipping flour into the island of Hayti, a recent steamer load from Halifax having included 225 bbls, the Roller Miller asks, what are United States millers going to do about it? Why friends, you do not need to let the matter give you any concern. The people of Hayti are being well served and getting just the article they want when they buy Canadian flour. You know that.

x x x x

UNMISTAKABLE evidence of the size of the financial depression with our neighbors to the south is found in the fact that in the winter wheat sections farmers are already commencing to deliver new wheat quite freely. This circumstance, if it should be found that the practice is likely to be very general and continued for any length of time, may hold an important influence in bringing back matters to something near a better level. Commercial depressions have in too many cases been intensified by this unfortunate habit of the farmers of hanging on to wheat for a higher price. The best statistics show that in 9 cases out of 10 the farmer is the gainer by selling his wheat early in the season. With the market experience of several years back he should not now in any case require evidence to further pursue the folly of holding his wheat. During the past year the loss sustained in our own country as well as elsewhere in storing wheat has really run into tremendous figures, and the lesson ought to be worth something to everybody concerned.

x x x x

At a time when the memorial of residents of Manitoba and the Northwest territories, asking for better freight rates, is met with the reply from our railway magnates, that rates to-day are as low as the volume and character of the business will permit, some observations by Prof. Henry C. Adams, are timely. His data is of American roads, but some of his conclusions will apply as aptly in one country as they will in another. One remark is that the figures given forth by railway corporations as evidence that their profits will not permit of further concessions in rates, are not unfrequently "fixed" for publication, and the claims of these corporations are not candid. It is the case, so far as the United States is concerned, that 43,000 miles of railway, or the amount equal to 24% of the total length of the line, have been placed under the protection of the courts. Dividends have also fallen off. "Facts of this sort," says Mr. Adams, "would seem to warrant the despondency with which railroad managers view the situation, but before allowing the interpretation it may be well to inquire if all the facts in the case have been presented. The statement that 61% of railroad stock pays no dividend does not necessarily mean that the business of transportation is carried on at a loss, for not only does it disregard the parasitic organization, whose income are not included in the published reports, but about 25% of railway stock is the property of railways in their corporate capacity and consequently represents a phase of railway consolidation." In other words, Mr. Adam's contention is that railway assets and liabilities, sometimes like government figures of an alleged surplus, can be so arranged that it would take a Napoleon of finance to decide whether everything will square with the claims made.

India reports a wheat crop of 2,946,310 tons of wheat for 1894, against 3,245,210 tons in 1893 and an average of 3,206,842 tons for a series of years. Later returns may increase the present crop somewhat.

ASPIRATION FOR ROLLER MILLS.

ASPIRATION has for many years been applied to roller mills in various forms. As ordinarily applied by way of suction through spouts it is rather an awkward, cumbersome contrivance and very much in the way. Frequent efforts have been made to simplify its application and to increase its effectiveness. We present herewith a design of aspiration which is incorporated directly with the roller mill itself making it entirely self-contained. It is the invention of Jacob Heeffner, an Austrian miller. Fig. 1 is a sectional elevation. Fig. 2 a sectional elevation and Fig. 3 the cleansing arrangement. The device is composed of a revolving screen A, right and left hand flights BB, inserted in the cylinders CC. The revolving screen A is supported by the cylinders CC, by means of strips bb, over which the wire is stretched. The screen is revolved by means of gears e and f. The shaft g is driven with a belt from the pulley w on fast roll journal, whereby the flights BB are driven at a high speed, causing the hot air to discharge on both sides of machine while the particles of material, attracted by the suction, lodge on the outer surface of the screen. A knocker s is applied, whereby the longitudinal strip h is made to bear on the wire surface for the purpose of keeping it clean. Motion is given to the knocker by means of the disk v. KK are protectors which prevent the bulk of the material

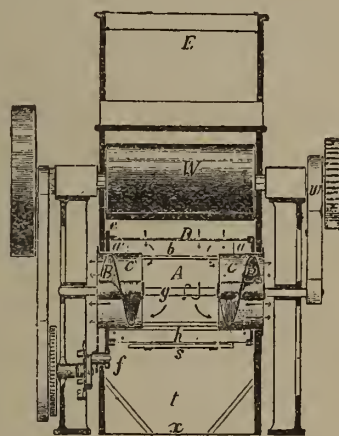


FIG. 1.

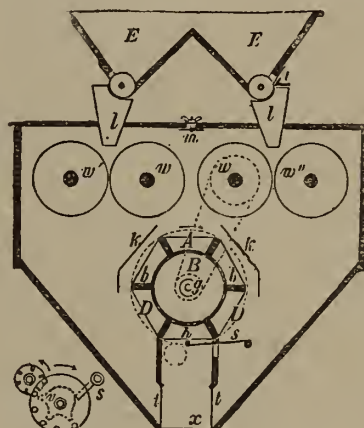


FIG. 3.

FIG. 2.

from coming in contact with the wire, and only the lighter particles are carried over the top edges of the protectors. Air is permitted to enter the machine at *t* through the hoppers *ll*. Aside from this, air may be permitted by means of the adjustable valve *m*; *ll* are self-acting valves for the purpose of delivering the ground stock to the outlet of the hopper.—Milling.

THE FUTURE OF WHEAT.

WRITING on this subject in the American Agriculturist for May, Henry Stewart says:

Statisticians have tried to prove that within five years the value of wheat would be at least two dollars a bushel, and that this price would be reached by gradual advances from now onwards, until the consumption of it would overtake the production and then surpass it, thus giving the wheat grower the absolute command of the markets of the world. It is doubtful if any farmer was deluded by this roseate view of the position of the wheat grower, for every intelligent person knows that the reserve of land suitable for the culture of wheat within the boundaries of North America alone is sufficient to more than double the present product, without even any improvement in the cultivation of this crop. And certainly every farmer knows that if the right method were taken the present product might be easily doubled without adding a single acre to the area now under this crop. For, while the average product of wheat is not more than eleven or twelve bushels per acre, there are many farmers

who produce three times this yield, and what these farmers are doing others may and can do if they will only use the same methods.

But if we look abroad we find the very same conditions prevailing over enormous areas of territory suitable to the growth of wheat. There is that vast stretch of land known as the Northwest Territory of Canada, and which is now being only simply touched by the plow, but when fully occupied may produce not less than two thousand million bushels of wheat, which is about the whole product of the world at this time. The farms of Europe may be wholly left out of the calculation, and only the at present undeveloped fields taken account of. And these will include Australia, a greater part of Africa, and the vast area of Argentina just now opened to this enterprise, with other parts of South America that will yield the best quality of this grain. And to make our story as short as possible we may confine ourselves to Argentina alone.

Here are 240,000,000 acres of fine wheat lands that two years ago no one thought of as a wheat exporting territory. Indeed, only a few years back this great country procured its supplies of wheat and flour from the United States, but last year it exported 20,000,000 bushels as a beginning, and the present season expects to have a surplus of 50,000,000 bushels for export. And by the use of the most improved machinery and large enterprise, wheat is now grown at a good and indeed attractive profit of twenty-five cents a bushel, which is about the cost of it in the Canadian Northwest Territory and the Dakotas. At only ten bushels an acre, here alone is a doubling of the world's product. At the present time Canadian wheat is being carried from Winnipeg, in Manitoba, to England for 28 cents a bushel, and the wheat of Argentina can be laid down in the same market for 50 cents a bushel. Considering these vast fields and their possible, not to say probable or certain products, in the near future, what is then the position of the American farmer? He must grow wheat, or change entirely his rotation and system of farming. The pivot on which his rotation revolves is wheat, and he cannot abandon it. Then he must make up his mind to compete with these

foreign wheat growers and meet them on equal terms. And doubtless he will be able to do this and produce this grain for 25 cents a bushel, when he adopts the indispensable improved methods of culture by which the yield can be made to reach forty bushels to the acre. And this seems to be the present view of the future of wheat that must be taken, and indeed that presents itself to the American farmer.

ENGINEERS WHO TINKER.

THE American Machinist comes to the rescue of the engineer who knows enough to "tinker" with his engine when it needs it, in these words: "There are men around engines who ought to do 'tinkering,' but they are not engineers. They are men who rattle around for about a dollar and a quarter a day. These be they who never ought to get within a half-mile of an engine with wrench or hammer. No one ever knew a real engineer to do much tinkering. He is just lazy enough not to do useless work, and just enterprising enough to do such tinkering as is required. An engineer who hasn't push enough about him to tinker the pounds and other little ills out of his engine ought to get an easier job without serious delay. He might do well at holding down a chair, or something of that sort, but as an engineer he hasn't just a little chance of success. In the best interest of his employer he ought to get another job before his engine has to go to the machine shop, or the machine shop go to the engine."

MILLING IN CANADA

ANNUAL MEETING DOMINION MILLERS' ASSOCIATION.

Large Attendance of Members—Reports of Officers and Standing Committees—Much Valuable Work Accomplished—Papers on Practical Subjects—Interesting Debates.

THE second annual meeting of the Dominion Millers' Association held since this organization became an incorporated body convened in the Board of Trade building on Tuesday, August 7, commencing at 2 p.m.

The president of the Association, Mr. A. H. Baird, of Paris, occupied the chair, supported on his right by Treasurer Wm. Galbraith, and on the left by Secretary C. B. Watts.

Among the prominent members present were:

Angus Plewes, Markdale; J. W. Ford, Markdale; Simon Plewes, Creemore; W. H. Finemore, Burlington; P. Quance, Delhi; Jas. Stark, Paisley; Alex. Dobson, Beaverton; John Rock, Springford; D. Clark, Ayr; John Goldie, Ayr; R. Neilson, Ayr; C. F. Gray, Seaforth; W. J. Baldwin, Aurora; S. R. Stuart, Mitchell; A. Wolverton, Wolverton; R. A. Thompson, Lynden; J. H. Dracass, Streetsville; W. B. Robson, Hamilton; J. C. Vanstone, Bowmanville; J. L. Green, Greenwood; P. R. Hoover, Green River; J. E. Pearen, Brampton; H. P. Shepherd, Primrose; J. D. Saunby, London; Frank Harris, Springfield-on-the-Credit; Chas. Smith, Campbellford; F. W. Findlay, Hastings; Chas. Needler, Millbrook; John Hull, Lakefield; John Brown, Dunnville; P. G. McCargar, Lakefield; W. H. Schneider, Mildmay; T. O. Kemp, Seaforth; W. D. Mace, Tamworth; F. W. Rollin, Madoc; T. F. Dexter, Sebringville; H. Barrett, Port Hope; T. Foulles, Oakville; Jas. Goldie, Guelph; E. D. Tilson, Tilsonburg; R. Noble, Norval; R. H. Vick, Orillia; James Robb, Valleyfield, Que.; F. Heimbecker, Hanover; W. J. Snider, Conestogo; John Galbraith, Allandale; D. A. Thompson, Orillia; M. McLaughlin, John Brown and J. L. Spink, of Toronto.

SECRETARY'S REPORT.

The report of the Secretary, Mr. C. B. Watts, was read as follows:

The attendance at our meeting a year ago was the largest we have had for several years. The idea of an excursion to Niagara Falls by steamer and electric railroad proved so attractive that a party, consisting of members, their wives and friends, to the number of 140, had a most enjoyable trip to that point. The only drawback was that only about 50 notified the secretary of their intention to be present at the dinner, while no less than 120 were there, entirely overtaxing the facilities provided for the occasion; but for this the committee could not be blamed. So enjoyable was the trip, that on our road home, and since, a number of our members have suggested that it be made an annual affair.

During the twelve months which ended July 1st., the beginning of our financial year, there have been matters of the deepest interest to the milling fraternity dealt with by the Association, and though there has only been one General Meeting during that time, the executive committee and other committees have held more meetings than in any previous year, and have decided that it will be necessary to meet at least bi-monthly in future, to do justice to the important matters which are brought before them from time to time.

The Executive held five meetings during the year, on Sept. 13th, and Dec. 20th, 1893, April 17th, June 12th, and Aug. 7th, 1894.

The Freight Committee only held two meetings during the year. There were, however, several meetings of the sub-Committee, and a deputation visited Montreal on two occasions, to attend joint meetings with the Railroads and Steamship Companies, regarding the freight rates on flour for export.

During the year ending June 30th, the following were admitted to membership: Evans & Evans, Thorndale; W. D. Mace, Tamworth; J. H. Harvey, Cobocconk; J. R. Kidd, Tilbury; Roche Bros., Springford; A. B. Bell, Kimberley; C. & J. G. Wilson, Masson, Que.; Campbell & White, Oshawa; Geo. Elphick, Pinkerton; Stewart and Graham, Brussels; F. Glebe, Shelburne; Sylvester Wright, Bracebridge; W. H. Schneider, Mildmay; Rollins & Williams, Exeter; Bennett & Constable, Spencerville; C. Copeland & Son, Penetanguishene; C. E. Martin, Lindsay; Hewson Bros., Durham; making 18 new members as against 14 the year before. A total of 205 members paid their annual dues last year, as against 210 members the previous year. The reduction in membership can easily be accounted for by the large number of removals by deaths in our membership and the number of mills burned during the year.

The treasurer, Mr. Galbraith's report, again shows a balance on the right side, of \$202.29. In addition to the ordinary expenses, the disbursements included a balance of the cost of incorporation \$155.00, and also \$39.00 for printing the by-laws. There is also due to the Association \$93.75 for advertising in the weekly Bulletin while the liabilities of the Association are only \$9.00.

The Dominion Government appointed the following members to act on the Boards setting the various standards for the current year: Robt. Noble, Norval, on the Flour Standard Board at the Port of Montreal; J. L. Spink, on the Ontario Grain Standard Board, and the Central Wheat Buyer on the Manitoba Standard Board. So satisfactorily was the work of all these boards done,

that I may say I have not heard a single complaint of the standards chosen, excepting that the distinction between mixed wheat and red and white, and between mixed oats and white oats, was not sufficiently marked in the standards chosen by the Ontario Board.

The question of under-billing has been given considerable attention, especially in the first half of the past year; the correspondence having been maintained not only with the G. T. R. and C. P. R., but also with the Intercolonial Railway. That the efforts made, backed up by the strong stand taken by the Association on this question has resulted in much good, and while no doubt there are still individual cases in under-billing, I believe the evil is almost entirely stamped out.

Acting under instructions of the chairman of the Freight Committee, to whom the question of short weight barrel and bag flour was referred by the executive, I have endeavored to secure sufficient material to justify action being taken against any parties who may be guilty of these practices; and although some evidence has been secured, it is not sufficient to lay an information or to report at this meeting.

There has also been a variety of matters dealt with in the office during the past year, which, if they had been neglected, might have been fraught with grave consequences in the milling industry, but which cannot be well referred to in detail in this report.

The following members suffered either total or partial loss of their mills by fire during the past year: D. S. Clemens, Winterbourne, July 1893; Walker, Harper & Co., July 1893; The Hesherton Milling Co., Flesherton; W. H. Hill, Sarnia; The Tavistock Milling Co., Tavistock; Geo. Elphick, Pinkerton, March 1894; H. Birrell, Port Hope, March 1894; J. H. Harvey, Cobocconk, April 1894; S. Lukes, Bradford, June 1894. In the last mentioned the damage was very slight; but I have been unable to get a full report of the losses and insurance in the other cases.

I regret to say that the "grim reaper, Death" has been active amongst us since we met here last, as the following record will show: A. C. Mann, Baltimore; P. Kelly, Blyth; Robt. Bruce, Gormly, and A. McFall, Bolton, have "crossed the bourne whence no traveller returns."

I cannot close without thanking some of our members for the kind words of appreciation in their letters, of the work done and information supplied during the past year.

The secretary's report was unanimously adopted, and a vote of thanks tendered to Mr. Watts for his ability, courtesy and tact in the office.

TREASURER'S REPORT.

Mr. Wm. Galbraith, treasurer, read the following report:—

I beg leave to report, for the year ending June 30th, 1894, that the total receipts were \$1458.41, consisting of:—

RECEIPTS.		
Annual dues—165 mills at \$ 5.00.....	\$ 825 00	
20 " " " 10.00.....	200 00	
6 " " " 15.00.....	90 00	
3 " " " 20.00.....	60 00	
3 " " " 25.00.....	75 00	
1 " " " 35.00.....	35 00	
1 year 8 " " 2.50.....	20 00	
Total annual dues.....	\$1305 00	
18 new members, entrance fees, at \$5 00..	90 00	
(One of above for 1893)		
Advertising.....	63 41	
	\$1458 41	
Less commission on cheques.....	.23	
	\$1458 18	
Cash in hand July 1st, 1893.....	223 11	
	\$1681 29	

DISBURSEMENTS.	
Expenses annual meeting, 1893.....	\$ 10.00
Balance excursion expenses.....	4 00
Auditor, 1890 to 1893.....	38 00
Printing By-laws.....	39 00
Legal expenses, Edwards' bill.....	155 00
Expenses of members attending Executive meetings.....	156 47
Expenses of Freight Committee.....	4 00
Stationery, envelopes, etc.....	10 75
Printing Bulletin, etc.....	121 50
Postage, Bulletin, etc.....	143 38
Secretary's salary.....	500 00
Office rent, Association portion.....	62 00
Clerical help.....	100 00
Legal expenses.....	17 54
Expenses, deputation to Ottawa.....	53 95
Expenses, two deputations, Montreal.....	64 00
Bank charges.....	1 41

Balance on hand	\$1479 00
	202 29
	\$1681 29

On motion the report of the treasurer was unanimously adopted and pleasure expressed at the satisfactory conditions of the finances.

REPORT OF EXECUTIVE COMMITTEE.

The secretary read the following report of the Executive Committee:—

The Executive Committee held five meetings during the year. At our first meeting the Freight Committee was appointed, consisting of the following gentlemen: M. McLaughlin, Toronto, chairman; Peter Shirk, Bridgeport; J. D. Saunby, London; J. D. Flavell, Lindsay; Jas. Goldie, Guelph; A. H. Baird, Paris, and H. Barrett, Port Hope. Also the Seed Wheat Committee, as follows: T. O. Kemp, Seaforth; J. C. Vanstone, Bowmanville; J. B. Bechtel, Burford; N. H. Steens, Chatham, and John Galbraith, Allandale.

The following names were submitted to the Government, from which to select your representatives on the Boards of Examiners, to select the standard samples for the year: T. O. Kemp, Seaforth; James Goldie, Guelph; W. H. Meldrum, Peterboro; J. C. Vanstone, Bowmanville to act on the On-

tario grain board. Also the names of Robert Noble, Norval, and J. Galbraith, Allandale, to select the flour standards, and the name of the Central Wheat Buyer, to assist in setting the Manitoba grain standards.

We again appointed Mr. Geo. Edwards accountant, to audit the books of the treasurer and Central Wheat Buyer.

Re Eastern Agent.—The Committee you appointed at your annual meeting, to consider the question of an eastern agent to sell flour, made the following report:—In the opinion of this committee, it would be a wise and prudent move for the Dominion Millers' Association to appoint a competent man, at a salary to be determined upon by the Executive Committee, to represent the different millers, who belong to this Association, at some point in or east of Montreal, and that we hereby recommend the said appointment, and that a meeting be called at the earliest date possible, to take action. We gave this report our most serious attention, but as the difficulties surrounding the question appeared to be almost insuperable, we did not see our way clear to take action thereon, nor did we deem it wise to call a special meeting of the Association. We have therefore deemed it advisable to place it on the programme, that the report might be considered at this meeting. We also considered the advisability of adopting a scheme to post our members regarding dishonorable grain or flour merchants; but did not deem it wise to take any action in this respect at the present time.

Re Cyclone Dust Collectors.—A number of our members having written to the Secretary, with regard to a claim for royalty for using the cyclone dust collectors, made by Mr. Knickerbocker, of Jackson, Mich., appointed a committee to see what arrangement he could make, whereby our members would receive a license at a smaller payment than was being asked. After an interview with the Secretary and Mr. Knickerbocker, who came over for the purpose, and considerable correspondence with his solicitor, we arranged that our members should only be charged \$20 each on cyclones used on mid-dlings purifier, and \$30 for those used for other purposes. Some of our members made a saving sufficient to pay their fees for several years, and also saved considerable costs on suits, as already stated.

In the proposed changes in the tariff of the United States, known as the Wilson Bill, the following clause appeared: "Breadstuffs and farinaceous substances, buckwheat, corn or maize, cornmeal, oats, oatmeal, rye, rye-meal, wheat and wheat flour 20%, but each of the above products shall be admitted free from any country who impose no import duty on the like product which is exported from the United States." As this appeared inimical to the interests of the Canadian millers, inasmuch as it was proposed to retain the full duty on mill offals, which is the only thing we are now able to export to the United States, and which it might be to the benefit of our mills to have admitted free into those markets about which there is no difference of opinion among the millers of Canada, we appointed a deputation to wait upon the Government at Ottawa, to see that our interests were fully protected, should any change in the Canadian tariff be proposed. The delegates were informed by the ministers, that, the flour mill products and wheat were not included in the schedule of articles on the Statute Book from which it was proposed to remove duty provided the United States do the same; and that it was not their intention to make any alteration in the tariff on these articles, as they did not think it would be in the best interests of either the farming community, millers or consumers, to make a change.

It having been proposed by the Dominion Government to place a duty of 10% on half bleached jute cloth used for the manufacture of flour bags, we at once entered a protest against this action, as the whole of the proposed tax would fall on the millers, there being no jute cloth manufactured in this country, and we are pleased to report that the proposed tax on our industry was abandoned.

Hearing that a petition had been sent by the Winnipeg Board of Trade to the Dominion Government, asking, among other things, that the Board of Examiners to select the Manitoba grain standards should consist only of persons residing west of Lake Superior, which would not only exclude our representative, but also all other eastern representatives, we memorialized the government protesting against any change, as also did the Boards of Trade at Toronto and Montreal.

Re Export Freight on Flour.—The great discrimination in the export freight rates from interior points in Ontario, in favor of wheat as against flour, demanded our earnest attention during the past year. What has been done in our endeavor to obtain as favorable rates on flour as on wheat will be seen in the very full report of the Freight Committee on this question. Should we fail to obtain redress in any other way, it is our intention to lodge a complaint with the Railway Committee of the Privy Council under the railway act, that the flour millers may be placed at least on an equal footing with the exporters of grain at all times.

Re Underbilling.—As the penalties to which persons who are found guilty of the above practice render themselves liable, appear wholly inadequate for the gravity of the offence, the railways have requested us to procure the necessary legislation under which the honest shipper will be protected from the dishonest one, by enabling the railways to collect heavy extra charges with freights, in cases where overloading is discovered. It is proposed on all over weight found in a car, not shown on the shipping bill, to charge double the regular rate, and also to charge on the whole quantity contained in the car any additional mileage which it may have been necessary for the railway to haul the car in order to weigh it. With your approval we will seek to obtain such amendments to the railway act, or other legislation as may appear necessary to our Executive Committee, to give effect to the above proposals.

We think that from the above it will be seen the work done by the Association is of great importance and direct benefit to every miller in the Dominion of Canada, and we trust that these millers who are not members of our Association will show their appreciation of the benefits which they have received by identifying themselves with us, at an early date, and that by increased numbers and influence, we may have even a greater

weight in the future than in the past. We hope that the programme that has been prepared for the general meeting will be found an interesting one, and that every member present will make arrangements to take part in the excursion to Niagara Falls to-morrow, and that by social intercourse we may become better acquainted with one another, and have the "bond of friendship" as well as the common interest to hold us together.

THE EVIL OF UNDER-BILLING.

The clause on underbilling in the report of the executive gave rise to considerable discussion. It was argued by Mr. John Brown that the Association was not called upon to accept suggestions from the railways as to what course they ought to pursue, or to help them out of any apparent difficulty. The Association ought to take a stronger position on the question of under-billing and so express their convictions at this meeting. Mr. W. H. Finnemore, of Burlington, was favorable to leaving the clause as reported by the executive. He did not see that any honest shipper could object to it. The honest shipper should be willing that no man should have an advantage over him.

The outcome of the discussion was that the clause on under-billing was referred to a special committee, consisting of Messrs. Noble, Tilson, Foulles, J. Brown and C. Smith, who at a later stage in the proceedings reported that said clause be amended by making it to read as follows: "As the penalties to which persons who are found guilty of the above practice render themselves liable appear wholly inadequate for the gravity of the offence, the railways have requested them to procure the necessary legislation under which the honest shipper will be protected from the dishonest one by enabling the railway to collect heavy extra charges with freights; that the executive committee be and are hereby instructed to take such steps as to have the Railway Act so amended as to compel all the railways to charge on all overweight. Also to obtain legislation making under-billing a criminal offence, and those being found guilty of the above to be punished in a manner similar to the Interstate law of the United States of America."

With the exception of this one change in the report of the executive, it was unanimously adopted by the Association.

PRESIDENT BAIRD'S ADDRESS.

President Baird delivered a carefully prepared address, that met with a close hearing and was warmly appreciated by the members. He referred with some detail to the work of the Association and the Executive during the year now closed.

The year had been, he said, an exceptionally trying one for those interested in flour milling, the price of grain and flour having reached a lower point than at any period since Canada has had a milling industry of any extent. When we last met the price of wheat had reached a point which it was thought impossible for it to go under, being below the cost of production as generally accepted, but we have been compelled by the process of events to lower our opinions on this as well as other subjects, for we find during the past few months wheat has been sold and delivered in Liverpool for less than a cent a pound, and during a greater portion of the year the prices of both English and foreign wheats have been lower in Great Britain than ever before known. Under these conditions we might expect to see the production greatly reduced, but all indications point to another large crop.

Special attention was drawn to the milling industry in foreign countries, and its relation to the governments, simply to show what efforts are being made to give encouragement to the industry by not only preserving their home markets, but also encouraging millers to do an export trade. In Germany the miller can import any quantity of foreign wheat and escape paying duty by exporting a like quantity of native grain. Thus they were able to obtain any desirable quantity of foreign wheat for grinding or mixing purposes free of duty. In Italy the duty on foreign flour has been increased during the year equal to about 40 cents per 220 lbs. In Portugal the import of foreign wheats is prohibited, except to certain millers who are allowed to import a limited quantity. In France the law is such that a miller who imports foreign wheat can cancel his bond by exporting about 10% less flour than wheat. This state of affairs was occasioning some alarm to English millers, who see possible hurtful competition. On the other hand, English millers are considering the advisability of entering the export field themselves. This, however, could only be possible as long as present low wheat prices prevailed. In Russia efforts are being made by the government to promote an export trade in flour.

Reference was made to the disadvantage Canadian millers experience because of unfair rates, and dwelt on at length in a special report from a committee of the Association.

Millers who by stress of hard times might be considering the advisability of dropping their membership in the Association, were reminded of the close-fisted farmer who thought he would do without his newspaper so as to save a dollar, and then through lack of information he lost five dollars on his next sale. The secretary was being paid to look after the interests of the members and they should make use of him by seeking his advice on frequent occasions, whether it be a question of price of wheat or on other subjects. The hope was expressed that the evil of selling wheat on time would not be allowed to grow, for its baneful effects must be plain to any intelligent miller.

In retiring from the presidency, Mr. Baird thanked the secretary, executive committee, and many members for the valuable aid they had rendered him during his term of office.

THEY APPRECIATED HIS LABORS.

President Baird was asked to withdraw from the chair for a time, treasurer Galbraith taking the chair, when on motion of J. L. Spink, seconded by M. McLaughlin, a cordial vote of thanks was tendered the retiring president for the able, courteous and self-denying manner in which he had performed the duties of chief officer of the Association during the year. The resolution was passed amid the plaudits of the members.

FREIGHT COMMITTEE'S REPORT.

This report, read by the secretary, is as follows:—

Following up the work done last year by the Association, in the direction of doing away with the discrimination in freight rates which existed against flour, your Freight Committee have made strenuous efforts to induce the railways to give on flour the same rate for export as they do on wheat.

The members have cause to remember that in former years this discrimination acted very prejudicially to the interests of the mills. During the past winter the evil became so great that it was plainly evident that some steps would have to be taken at once, unless the millers were prepared to stand idly by and see their flour export trade completely wiped out, it being reported to us, that while a through rate of freight was given, of 20c. per 100 lbs. on wheat for export from north and west points to the old country, the rate asked on flour at this same time was 29c.

This discrimination was so outrageous that your Secretary took advantage of being in Ottawa with the delegation regarding the American tariff changes, to lay the matter before the Hon. Mr. Bowell, Minister of Trade and Commerce, and pointed out to him that a continuation of this condition of affairs would only result in the complete annihilation of the export trade in flour.

As the result of this interview, Mr. Bowell arranged a meeting for the 24th of February, at Montreal, between Mr. Sergeant, General Manager of the G.T.R., Mr. McLaughlin, Chairman of this Committee, and your Secretary, at which the Hon. Mr. Bowell was present. Mr. Burton, General Freight Agent; Mr. Cunningham, Assistant Freight Agent, and Mr. Fraser, General Steamship Agent of the G.T.R., were also present.

The conference opened by reading an extract from a letter received by Hay & Harrison, of Ailsa Craig, from David Plewes, 10 Drury Lane, Liverpool, written on Jan. 26, 1894:

"In reply to your favor of the 12th inst., 17/9 to 18/- is the very highest obtainable, but I ask you how I can sell flour when your freight is 29c. per 100 lbs., when wheat is only 20c. per 100 lbs. The thing is impossible. If arrangements could be made so that your rate on flour were even 2c. per 100 lbs. over the current rate of freight on wheat, I could sell lots of flour. If you had had a 22c. rate on flour, alongside of a 20c. rate on wheat, you could have filled all the orders I have sent you. Why don't your Association pull in this direction? * * * If there is no better arrangement to get no better comparative freights on flour, as against wheat, I will return in June, as it is utterly impossible to sell freely against such odds in freights."

We pointed out that the difference in freight gave the English miller, buying our wheat, an advantage over the Canadian miller of equal to about 20c. per barrel in freight alone; or in other words, the G.T.R. was offering a bonus of that amount to the English miller to take the wheat out of Canada, instead of encouraging the grinding of it in this country, which would not only be beneficial to the millers and farmers, but especially so to the railways themselves. Any mill doing an export business is compelled to bring in wheat by rail, on which they pay an average freight of say 5c. per 100 lbs., which is entirely lost to the railroads when the wheat is exported, and the railroads lose the freight on coal required to run the mills as well.

There are also several other items, such as staves, machinery, and all other supplies necessary to run the mills, and maintain the men employed in them, on which they receive local freights, while they receive nothing from the English millers or grain dealers in this way; so we were entitled to receive every consideration possible at their hands.

To put the mills on really a fair basis the railroads should allow the mills to bring the wheat in, grind it, and export the flour to its destination, by paying 1c. per 100 lbs. as stop-over charge, only, in addition to the through rate of freight which the grain exporter would have to pay, from the original point of shipment, through to the old country.

That they now did this on Manitoba wheat, and formerly did it on wheat brought from the United States, and that they should place the farmers of Ontario in as good position as they did the farmers of Michigan.

We also called their attention to the fact that the giving of these private special rates was a violation of the Railway Act; so they were not only acting in such a way as would inevitably result in the destruction of the milling industry in Canada, as

a shipping business, but they were also breaking the laws of the Dominion.

Mr. Burton, in reply, said that one reason that they could not give the same rates on flour as on wheat was because the steamship companies charged a much higher rate to carry flour than to carry wheat; also that they wanted sometimes a cargo to be delivered at Portland inside of a couple of weeks, and flour could not be supplied quickly enough; that it cost a good deal more, and required a longer time to handle flour, and that they required grain for stiffening the ship where flour would not do. Sometimes they could not get wheat in Ontario, and had to bring corn from Chicago to supply freight. That their quoted rates from north and west points were 25c. and 26c. on wheat when it was 29c. on flour; and that for the reasons mentioned above, they could not carry flour at the same rate as wheat.

It was sometimes necessary to make a special rate to get the necessary cargo, but in all cases of this kind, half the space was allotted to Toronto and half to Montreal, and anyone wishing to do so could take advantage of it. From Mr. Fraser's explanations, however, it was evident that only two or three parties in Montreal, and a similar number in Toronto, were offered this space at a reduced rate.

But we pointed out that while, as Mr. Burton said, the public rate on grain was 25c. to 26c., there was no doubt that the rate of 20c. was given, and also that the rates were not made public in the general sense of the term.

Hon. Mr. Bowell said that if the rates were posted in the Boards of Trade in Montreal and Toronto, the spirit, if not the letter of the law would be fulfilled, but thought the requests of the millers' representatives were reasonable, as while the wheat, which was the millers' raw material, was taken out of the country at a much lower rate of freight than was charged on flour, the miller certainly could not do any export business; but sincerely trusted that the railways would be able to arrange matters, so as to remove the great discrimination from which the millers were suffering.

Mr. Sargent said the G.T.R. could not deal with this matter alone, as the C.P.R. was also interested; and if the steamship companies would not carry the flour for the same rate as wheat, he did not know how the difficulty could be overcome. He, however, asked your representatives if they would attend another meeting, at which the representatives of the C.P.R. and the steamship lines would be present.

This meeting was held in Montreal on the 6th of March, when the agents of the Allan Line; Hamburg-American Steamship Packet Co.; Donaldson, and Beaver Lines, were present, together with the representatives of the railroads; also Mr. Flavelle, of Lindsay, and your Secretary, representing your Association.

Mr. Olds, the General Freight Agent of the C.P.R., said, after the ease from the millers' standpoint had been laid before them, that it was certainly the best policy for the country and for the railroads to give every possible encouragement to the manufacture of all the products of the country, here. This was Mr. Van Horne's policy, and the policy of the C.P.R., which they would carry out in every way possible.

The C.P.R. was not interested in this matter, as they had not been giving 20c. rates on grain for export, as they had no ships to find freight for. He said, moreover, that there was no doubt that grain, and all the products of grain, ought to be carried at exactly the same rates, that they were both in the same classification, and that in the United States they were always carried at the same rate, and there was certainly no reason why they should not be so carried here.

Mr. Cunningham, of the G.T.R., said the Dominion Millers' Association had requested that the same rate be given on flour as on grain for export, all the year round; and also that they be given the same through rate for export, and allow the wheat to be stopped at the mills and be ground, and the product re-shipped on the payment of 1c. per 100 lbs. stop-over charge.

Mr. Watt, of the Allan Line, said that the flour occupied 45 cubic inches per 100 lbs., stored in the ship, that wheat only occupied 40 cubic inches, and that therefore they wanted to be paid for the extra space the flour occupied, and that they did not care much what they carried, as long as they were paid for the space; but they always required a certain amount of grain to stiffen the ship. He said they always liked to carry a certain amount of flour, but could bag the grain, to take the place of flour. He also said that sometimes the rates on flour and grain varied to different ports, even at the same time. For instance, the rate on flour to Glasgow was 10.13c., while on grain it averaged about 11.38c. To Liverpool it was just the reverse, being 11.25c. on flour and about 10.50c. on grain.

Mr. Thom, of the Hamburg-American Steamship Line, said they were prepared to carry a certain quantity of flour, say 50,000 sacks a month, at the same price they would carry grain for. If, however, a greater quantity was offered, they would then expect to receive higher rates on the additional amount, as it will take the place of cheese or other higher class freights. If, however, they could not get the required quantity of flour, they would carry it at a lower rate of freight than grain.

The gentlemen representing the other steamship lines said their views had already been expressed by Mr. Watt and Mr. Thom.

Your representatives then stated that they were glad to learn that the steamship companies were willing to carry flour at the same rate as wheat, at all times, provided they got paid for the additional space, which at the rates quoted would be only about 1c. per 100 lbs. over the grain rate. This the mills could afford to pay, but it was a very different rate from the 4 or 5c. per 100 lbs., to, in some cases, 9c. per 100 lbs. extra, as mentioned in Mr. Plewes' letter. It was apparent that the great discrimination complained of rested entirely with the railroads.

Your Secretary said a telegram from Chicago had just been received, quoting the freight on wheat from Chicago to Liverpool at 27.34c. per 100 lbs., and on flour 27.44c. per 100 lbs.; only 1/10c. higher than on flour than on wheat; although the representative of the Allan Line stated that the rate then ruling on flour was about 1c. per 100 lbs. higher, to Liverpool, than

on grain. From this it would appear that the railroads in the United States were willing to carry flour from Chicago to the sea-board for a lower inland rate than they were getting on grain. There could be no question of the difference in terminal charges on wheat and flour, as it was through rates we dealt with in all cases quoted.

Your representatives concluded by saying that they simply asked the railroads, when they find it necessary to make special rates to get freight for their steamships, to allow the millers, through the Association, to take such space as they could fill, be it much or little, at the same rate as they gave the grain men, per 100 lbs.

Correspondence was exchanged with Mr. Seargent, and endeavors were made to obtain the concessions asked for; but while Mr. Seargent wrote on April 6th, that in regard to the port of Montreal, export rates are practically the same on flour as on grain, and that they are able, having regard to the steamship tonnage available, to follow that rule; but in regard to Portland, the season was now over, and would give them time to consider if anything could be done to meet the wishes of your Association. This was considered so unsatisfactory, as regards Portland, where the great discrimination has always existed, that we felt compelled to make a report to the Executive Committee to the above effect, recommending that unless satisfactory assurances are received from the G.T.R. that they will carry flour for export in future, at the same rate as grain, or within 1 or 2c. per 100 lbs., including the stop-over charge for grinding, that information be laid before the Railway Committee of the Privy Council, claiming that flour be carried at the same rate as grain, they both being in the same classification.

Under the date of June 16th Mr. Seargent wrote, reiterating all the old objections, which had been fully dealt with at both conferences, but adding nothing new. The only striking clause is the following:—"Our experience is that whilst we ship large quantities of grain from Portland to Liverpool, the proportion of flour is comparatively small." Under the circumstances we would be extremely surprised if it were large. He also states as follows:—"This is not the question in which the G.T.R. alone is interested; they have to act in concert with the United States railway companies."

In this connection we beg to submit to you a few figures, which we think you will find very suggestive. In December last a carload of milling product was shipped from St. Louis to Toronto, for 14c. per 100 lbs., a distance of 720 miles, and over several lines of railroads; while the rate from Collingwood on the G.T.R., 95 miles, or Harriston, on the C.P.R., 97 miles, was 10c. per 100 lbs., in both cases. In small shipments a similar state of affairs exists, as 5 barrels were shipped from Indianapolis to Toronto, a distance of 470 miles, over 4 or 5 different roads, and the rate was only 17½c., while to ship this same quantity from Toronto to Hamilton, less than 40 miles, the rate is 14c. To a point a couple of hundred miles east, the rate of 32c. per 100 lbs. was asked on double the quantity.

We also find that on comparing the freight tariff to Montreal, on flour, with the tariff given on grain for export, that while the rates vary, in groups, from 12c. to 16c. per 100 lbs., during the winter season, on flour they ranged from 12½c. to 18½c. per 100 lbs. Also, the whole district west of Toronto, for grain purposes, is divided into two divisions, groups 3 to 5 taking 14c. rate, and groups 1 and 2 a 16c. rate; while on flour the rates in groups from 3 to 8 are from 15 to 19c. per 100 lbs., after allowing 2c. per 100 lbs. for terminal charges on flour. In justice to the flour millers the same rates should be given to Montreal for flour for export, the same groups should apply.

We are also astonished to find that the Canadian roads apparently extend to the American millers advantages which we have never dreamed of asking for. To illustrate this, without saying that the points mentioned are correct, only that we are informed that wheat is carried by the railroads, from say Toledo to Detroit, and there milled, the product being shipped for export; and the rate charges are only the export rate charged from Toledo to the foreign destination, without any other charge whatsoever.

This is no more incredible than to learn that flour is carried from points about 100 miles west of Detroit to St. John, Newfoundland via Canadian railways to Montreal, and the through rate charged is only 2c. per barrel higher than it would be from a mill east of Toronto to the same destination.

Also the discrimination in favor of American mills, against Canadian mills, is even more glaring, in the case of local business. We are advised that in the interior points in Michigan to interior points in Eastern Canada, many cars of milled product have been shipped at a rate of 5c. per 100 lbs. lower than the rates from north and west points in Ontario to the same destination.

Taking all the above into consideration we think that it is a matter of surprise that the milling industry does not find itself in even greater straits than it is to-day, if that were possible.

It is useless for individual millers to attempt to get this remedied, as it places them in a position of either the railroads using their power to squeeze them, or else by an attempt to bribe them, and so kill the agitation for the time being. It then remains that the Association alone, through their Committees and Officers, are the only persons who can handle this question with any hope of success; and now is the time, when these facts are well known, and can be easily established, to take whatever steps are the wisest for the Association to attain the end in view.

The report of the Freight Committee was recognized as embodying a large amount of work and effort during the year closed, some of which would still need to be followed up with energy. The report was on resolution unanimously adopted.

REPORT OF THE CENTRAL WHEAT BUYER.

Mr. C. B. Watts, Central Wheat Buyer, read the following report:

In spite of the great depression under which the milling industry has labored during the past year, owing to the prices of grain

being so high as to prevent any flour worth speaking of being shipped either to Newfoundland or other points of export, and that the continued decline in prices on both wheat and flour has rendered it almost impossible for our mills to do a profitable business, I am happy to be again in a position to report that owing to the extent the millers have made use of the office during the past year, there is again a small surplus over the expenses.

During the past twelve months there have been no less than 145 mills who have purchased grain through this office, of whom 27 patronized it for the first time, and six of these, not being members, have paid the full commission to this office of \$5.00 for Ontario and \$6.00 for Manitoba wheat.

In addition to the non-members who have purchased wheat through this office, no less than 9 of the new members joining this year were brought in because they wished to take advantage of the benefits to be derived from the use of the Central Wheat Buyer.

It is, however, evident that there are still some of our members who do not take advantage of their connection with the Association to the extent that they might do, and there are also odd members who do buy grain through the Association, but probably do not know it, as it was purchased through other brokers.

The following are the details of the purchases made during the past year: July, 45 cars Ontario, 17 cars Manitoba, 1 car oats, \$135.00; August, 83 cars Ontario, 65 cars Manitoba, 1 car barley, extra commission Ontario \$3.00, Manitoba \$3.50, \$337.50; September, 70 cars Ontario, 92 cars Manitoba, extra on Manitoba \$3.50, 5 cars oats, 2 cars barley \$5.62, \$406.62; October, 102 cars Ontario, 111 cars Manitoba, extra on Manitoba \$2.50, extra on Manitoba \$3.50, and on 4 cars Manitoba and 30,000 bus. \$94.50, 1 car barley \$2.50, \$584.50; November, 168 cars Manitoba, extra 80c., 63 cars Ontario, extra \$3.00, \$549.80; December, 76 cars Ontario, 8,000 bushels Ontario \$40.00, 72 cars Manitoba, extra on Manitoba \$3.50, 6 cars oats, extra on oats \$2.50, \$393.00; January, 59 cars Ontario, 76 cars Manitoba, 7 cars oats, 1 car barley, 2 cars bran \$6.62, \$334.62; February, 65 cars Ontario, 40 cars Manitoba, extra on Manitoba \$10.50, 1 car screenings \$4.00, 19 cars Oats, extra on oats \$6.01, 1 car barley, 1 car corn \$7.25, 4 cars bran \$13.38, \$312.04; March, 44 cars Ontario, 45 cars Manitoba, 9 cars oats, 1 car corn, 2 cars bran, \$6.75, \$232.25; April, 44 cars Ontario, 32 cars Manitoba, 6 cars oats, extra on oats \$1.95, 1 car shorts, \$187.95; May, 40 cars Ontario, 56 cars Manitoba, 10 cars oats, 1 car barley, 1 car bran, \$3.75, \$251.25; June, 41 cars Ontario, 48 cars Manitoba, 1 car oats, 1 car shorts, \$5.00, \$209.50.

Making a total of 1,643 cars sold during the year, being 163 cars more than that of the previous year, in addition to 38,000 bushels sold to grain men.

The total commission earned by this office was \$3934.03, less cars not delivered, bad debts, and depreciation of assets, \$158.34, leaving a net for the year of \$3775.69, or about \$120.00 more than the previous year. The total expenditure was \$3256.59, making a profit of \$519.10 for the year.

The total number of cars which have been purchased at prices lower than the orders were given at (although in most cases they were on the lowest quotations obtainable at the time) is not large as it was the previous year, but still amounts to a very respectable total of 154 cars, as follows:—

65 cars were purchased	½c. below order.
63 " " "	1 c. " "
2 " " "	1½c. " "
6 " " "	2 c. " "
1 " " "	2½c. " "

On account of the almost total failure of the Ontario spring wheat crop, and the partial failure of the fall wheat crop last season, a number of our smaller millers could not obtain sufficient supplies from the farmers in their neighborhood to do their regular business, and not being on the list of those entitled to the regular milling rates, the local rates were so high as to be virtually prohibitory. I laid the matter before Mr. White, General Freight Agent of the Central District, and owing to his kindness succeeded in arranging the freight rate slightly higher than the regular milling rate, but very considerably below the ordinary local rates, and got something over 20 of our members on the list, from which they have derived great advantage, while the arrangement has been a very profitable one to the G. T. R. as well.

I have again this year, as in the past, when the prices asked by the grain men were decidedly above the legitimate market values, adopted the policy of advising millers to buy what wheat they absolutely must have direct from the grain dealers, instead of through me; and although it caused a loss of some commissions to this office, I considered it in the interests of millers as a whole.

Strong expression was given to the opinion by leading members that it would be unfair to Central Wheat Buyer Watts to allow his report to be adopted on a silent vote of thanks. The year had been one of unusual depression in grain and milling circles, and yet Mr. Watts, by untiring energy and watchfulness, had been able to present a report to the meeting showing that the office had continued a paying one and the year had closed with a balance on the right side.

The Central Wheat Buyer in replying to the resolution of thanks from the Association said that the most encouraging testimony to his work would always come from an increased interest by the millers in the work of the office. There were certainly individual advantages to every miller in buying through the office, and it was deserving of remark that a number of the new members who had connected themselves with the Association during the year had come in because of the advantages that they believed would come from the Central Wheat Buyer.

CHATTEL MORTGAGES ON FARMERS' GRAINS.

Mr. Jas. Goldie, of Guelph, led a discussion on chattel mortgages on grain and how they affect millers. He cited a case of personal experience where an agent of his purchased from a farmer 223 bushels of fall wheat and paid cash for it each day as delivered. A year before this date the farmer had given a chattel mortgage on the wheat growing in the ground. Then came a demand from the mortgagee that Mr. Goldie either return the wheat or make payment for the same. This action was defended by Mr. Goldie before Judge McDougall, and finally dismissed on a technicality. The judge, however, expressed the opinion that under other circumstances judgment might have been given for

the mortgagee. Under the English Bill of Sales Acts (which are different from our chattel mortgage acts) it has been decided in a case of National Mercantile Bank Limited, Ver. Hampton 5, English Law Reports, Queen's Bench Division, Page 117 (which is exactly similar to this case) that having regard to the terms of the bill of sale under the English Acts there was an implied license to the mortgagor to carry on his business of farming and to sell the wheat in his usual and ordinary course of business, and any bona fide purchaser from him would have a good title. There seemed to be no doubt, so far as Canada is concerned, that when the land on which the grain was growing has been correctly described in the chattel mortgage, a claim can be made on the man who has bought the grain. It was intimated that at one time an effort was made to put a bill through the local legislature remedying this evil, but for some reason it was withdrawn.

Mr. Goldie's remarks were thoroughly appreciated by the members of the association, and a resolution was passed instructing the executive to take steps to secure, if possible, legislation on this matter.

KIND WORDS FOR THE "MILLER."

The following resolution, moved by Mr. M. McLaughlin, of Toronto, and seconded by Mr. James Goldie, of Guelph, was unanimously carried. Several of the members spoke, commending the MILLER. "This Association desires to place on record, its appreciation of the able and intelligent work being done by the CANADIAN MILLER, in the interests of the grain and milling trades of this country. The CANADIAN MILLER has, during its several years of existence, proven an important means of communication between members of the milling trades located in various parts of the Dominion; and the importance of this work can hardly be too strongly emphasized. In the treatment of technical subjects connected with the trade, the CANADIAN MILLER has done much to help in the direction of important milling methods; for millers cannot forget that good milling depends in no small measure upon good milling methods. In the effort to develop the export trade in flour and other mill products, the CANADIAN MILLER has spared no effort to collect information concerning foreign export fields, and in many intelligent ways has endeavored to keep this subject prominently before the trade. During the years covering the existence of the Dominion Millers' Association there have been battles to fight, to wit, the grinding-in-bond privilege, the duties on flour, and the unfair freight rates made by our leading railways. In all of these contests, and others that will suggest themselves to members, the CANADIAN MILLER has stood loyally by the interests of Canadian milling; and with force, vigor and ability, contended for the rights of the trade. The CANADIAN MILLER is the only trade journal in Canada, devoted to the interests of milling, and as such, has strong claims upon the members of this Association, and millers generally throughout the Dominion. For these, among other reasons, the Dominion Millers' Association commends the CANADIAN MILLER to the support of its members, and to millers as a body in all parts of Canada."

OUR DEEP WATERWAYS.

A letter was read from the deep waterways committee setting forth the importance of this project and its special benefits to those concerned in the grain and milling trades. The Association was asked to appoint delegates to attend the convention on this matter, which would be held in the city in the early fall, and the executive committee were appointed to represent the Association on this occasion. Mr. John Brown, who is a member of the special citizens' committee making preparations for this project, intimated that the meeting would be open to all millers, and they would be glad to see a large representation of the Association.

OUR EXPORT FLOUR TRADE, AND WHY IT HAS BEEN LARGELY LOST.

The following able and comprehensive paper on the subject named was read by Mr. M. McLaughlin, of Toronto:

Canadian flour has found entrance to the markets of many countries, but passing Newfoundland, the only important export flour trade this country has had has been with the British Isles, and it is of this trade I shall speak.

Our export trade in flour has at times, in proportion to the crop grown, been extensive, and has been always an alluring bait for millers having a surplus milling capacity. Any miller who had an old country trade, long enough cultivated to carry with it some margin of net profit, will admit that it was the most satisfactory kind of trade to have, and will be glad to see the return of conditions favorable to it.

In considering why our flour trade with Great Britain has declined, and what are the obstacles in the way of improving it, two kind of causes present themselves; conditions that are, and must be, beyond our control, and conditions that are remediable by this Association

and by the Government of this country, in the interests of the trade of this country.

The uncontrollable causes are many and serious, and among them is the lower cost of wheat production in certain countries, which are tributary to English, but not to Canadian mills. In India, where the wage of the agricultural laborer is less than 5 cents per day, and where the climate and soil are both favorable to wheat growing; in Russia, and in the Argentine Republic wheat is produced at less cost than it can be done in Canada. All these countries supply a certain quantity of wheat cheap to the English mills, and offer no competition to them by shipping cheap flour, for they do practically no milling for export.

The English mill, in getting wheat lower than the Canadian mill does, allowing for freight, has an advantage that is readily seen. The higher value of offal in England than in Canada is so much clear leverage for the English mill.

Unfortunately for the Canadian miller, no practical means has yet been devised for exporting offal; and inevitably too, the greater the increase of our export flour trade, the less the value, per ton of our offal.

Without a practical export outlet, we over supply the demand of our own country, with the result of reducing values to us.

British industries are not nurtured by import tariffs as are the industries of almost all the rest of the civilized world. Fortunately for her millers, the conditions of wheat growing and transportation in widely scattered fields, give them a small measure of protection that is independent of tariffs.

Another among the uncontrollable, a most serious one, and one which has worked havoc, but which we may hope is temporary, is the reckless consigning of flour by the United States millers. For years past, but chiefly during 1891-2-3, large mills, and smaller ones, in that country, have sent forward overwhelming quantities of flour to British markets, without being sold. They pile it up in all the ports till the regular storage was filled; did not stop then, but kept on shipping, and filled garrets and nooks and crannies that were never used before for such a purpose, till the flour factor found himself smothered in American flour, and the trade there and here suffering from congestion and unavoidable decline in prices that must follow. This consigning rendered it unnecessary for the British flour factor to buy abroad. Why should he buy, when foreign millers were so eager to send forward on consignment? This is undoubtedly one of the greatest among the causes, perhaps the very greatest, for the decline in our export flour trade. It is one that in my opinion will disappear. United States millers have been doing abroad what nearly every man in this chamber has done for a longer or shorter time at home. We have all helped to fill our Eastern markets with consigned flour, and all learned the same lesson of loss that United States millers have been learning abroad. It is fair to predict that as we were cured they will be cured, and this great obstacle to the Canadian miller doing a legitimate selling business in export flour will become only a bitter memory to the trade of the country south of us. Leaving out of the field this torrent of unsold flour, the contest will be between the millers in Britain and the millers on this side. With equal prices for wheat, and equal prices for transportation, Canadian millers have little to fear from legitimate competition from the United States millers.

Canadian millers, however, pay more for wheat than United States millers to-day. A comparison of prices any year, and all the year round, will show the bonus received by our farmers for their wheat, over the price received by the farmers in the United States. While this is a good thing for the Canadian farmer, it is a serious handicap for the Canadian miller who seeks to send any portion of his product to the British market. The remedy to this obstacle in trade is in our own hands.

Great among the causes for stagnation in our export flour trade, and great among the obstacles to building up that trade, is the discriminating system of carrying, by which wheat is transported from this country at a lower rate than flour is. We are all well acquainted with the facts, and fully conscious of the consequences of having to pay more freight on flour than on wheat. In a country where one of Her Majesty's ministers is specially charged with promoting the interests of the trade and commerce of this country, we have a right to look with confidence to the removal of this impediment, at an early date. This done, we have it in our own power to so improve many of the conditions as to be quite on equal terms with our neighbors, in supplying our full share of the flour that enters the British Isles.

PLAIN TALK ON EXPORT FLOUR TRADE.

The excellent paper of Mr. McLaughlin on the export flour trade brought forth many expressions of commendation from the members. The subject was felt to be one of the most important that the Association could deal with. Mr. McLaughlin had handled it with remarkable ability and comprehensiveness. A number of members entered into a discussion of the question.

Mr. James Stark, of Paisley, was a pessimist on the subject. Our export flour trade, he said, had gone

from us and he could not see how it was to come back again. With flour shipped from the large mills of the United States to the Old Country at better rates than we can ship it; with wheat at the price of to-day, and the Argentine looming up as a big competitor in the wheat fields, "What the end is to be the Lord only knows," remarked Mr. Stark.

Mr. J. L. Spink said it would be a hard matter for the mills of this country to compete with a people who needed only to wear a linen towel for a garment and who were satisfied with a mess of bananas for a meal. For his part it had been a long time since he could get down to exporting flour on a paying basis.

Mr. David Plewes, the ex-secretary of the Dominion Millers' Association, and who had only returned from Great Britain a few days previous, after a sojourn there of two years and eight months, rose to his feet after repeated calls for "Plewes." He said that it was with mingled feelings of sorrow and gladness that he rose to address a meeting of the Dominion Millers' Association after an absence of nearly three years. He referred with touching pathos to the death of Mr. Thos. Goldie, who had occupied the position of president at the time he had left for Great Britain. Coming directly to the question of export flour trade, he said he would speak very plainly on the subject. The trouble, to a large extent, was in a nut shell. So long as Canadian millers were prepared to pay an average of 5c. a bushel more for wheat at the mill door than was the market price of the day, it was folly to suppose that they could manufacture flour and sell it at a price that would compete with the flour being shipped from the United States. If millers will get down to an export price for wheat then there will be an opportunity to sell their flour in the United Kingdom. Add to this the disadvantage under which the miller labored in the discrimination in freight rates between the rate on wheat and wheat made into flour and it did not require any great brilliancy to show how Canadian millers were handicapped in the race for export flour trade. Mr. Plewes believed that this difficulty could be gotten over by millers entering into a pooling arrangement for the shipping of flour. Shippers of wheat were given special rates by the railroads and vessel owners, because at particular times when these carriers wanted a large amount of freight they were able to give it to them in the shape of thousands of bushels of wheat. The railroads would not quote a low figure for 500 sacks of flour, but if the millers would stand together and offer them, say 8,000 to 10,000 sacks, he believed they would get the rate. Here Mr. Plewes took occasion to tell the millers somewhat plainly that they were altogether one too much afraid of the other. Unless the difficulties of export business were to be met in these ways, millers would continue to go on losing money until such time as having lost all their own, what the banks were prepared to give them, and their friends' money, they would have to come to a stand still.

Mr. James Goldie, of Guelph, did not see how it would be so easy a matter to get wheat down to the low prices at which Mr. Plewes recommended it to be bought, for, as prices ruled to-day farmers were seeking other means of disposing of their wheat, the feeding of cattle being one method, and a method that would be more largely followed, he believed, in the future.

This debate closed at 5:30 o'clock, when the Association adjourned to meet again at 8 P.M.

EVENING SESSION.

At 8 P.M. the Dominion Millers' Association was again called to order by the president, Mr. A. H. Baird.

DOUBTFUL PATENTS ON MILLING MACHINERY.

The following valuable paper on a timely topic was read before the association by Mr. H. Barrett, of Port Hope:—

This subject is of necessity, one that has considerable interest for those engaged in the milling business, and I have been requested to prepare a paper relating thereto. So many of the appliances used in modern milling are covered by patents and so many devices have been produced to obtain similar results it is impossible for any ordinary individual to keep informed upon such a voluminous subject. Therefore I do not undertake and I trust you do not expect an exhaustive paper from me.

Primarily, the matter that touches us all is how our interests are affected, and when affected injuriously how

they may be best protected. It is needless to say that every article, machine or device of any kind that the miller uses, which is covered by a patent, is enhanced in price by the largest amount that the Patentee thinks he can squeeze out of purchasers. Consequently the amounts paid out by the millers in the shape of royalties represent in the aggregate, a very large total and it is in this phase, that we, as an association, must regard such levies.

A great many patented devices are no doubt honestly and ingeniously thought out, and the originators rightfully obtain their patents; but on the other hand, the scrutiny given by an examiner in the patent office is not infallible, and many alleged inventions are only modifications or resurrections of ideas long before in the hands of the public. Indeed, in the United States, the authorities in the patent office do not pretend to draw any very fine conclusions, and it is notoriously the case that they go on the principle of issuing a patent on any colorable grounds, and let the adverse claimants fight out their disputes in the courts.

In Canada we have not had so many instances of such practices, but, as millers buy so many of their machines from American manufacturers who extend their patents to this country, we indirectly have to face the same state of affairs.

The old truism that "Everybody's business is nobody's business" can be applied to the question in hand very aptly. Each man concerned is fully aware, that he is affected as well as his neighbor; but it is hard to find a man who is philanthropic enough to go to the trouble and expense of fighting out public rights. The individual is apt to take the view, that he will have to undertake a troublesome dispute, involving him in endless bother and expense, and take chances of not being successful, or that he can avoid it all by submitting to the extortion of the claimant no matter how wrongfully demanded.

The points involved in this question of "doubtful patents" have been very lately brought to the attention of most of us, by the operations of the Knickerbocker Co. of Jackson, Michigan, who claim to be the owners of a patent on a device that is known as the "Cyclone Dust Collector."

"Cyclones" have been very generally used by millers during the last few years and were in some cases bought from manufacturers of milling machinery, and in other cases were built by the millers themselves.

At first the machinery manufacturers paid royalties to the Knickerbocker Co., but, when they found that the patent was disputed in the United States, and that they were not protected in any way, they ceased paying the royalty.

About a year ago circulars were sent out by a legal firm, Messrs. Maybee & Gearing, of Stratford, demanding a large royalty from every one using Cyclone Dust Collectors and hinting at legal proceedings if their demands were not satisfied. They gave color by citing an English judgment said to have been given in their favor. Afterwards the same firm instituted actions against a number of millers who were using the "Cyclones" and as the amounts claimed were not individually large, the parties who were sued preferred, in most cases, to submit to the extortion rather than incur the loss of time and expense of defending the suits.

The matter was brought up in the Executive Committee of this Association, but as there were no funds at their disposal to enable them to make a contest on behalf of the Association, added to which was the fact that a good many millers had already settled with the claimants, the Committee decided they could take no action beyond instructing the Secretary to correspond with Messrs. Maybee & Gearing and obtain as favorable a settlement as possible. This was done, and a reduction was obtained on their original demand, viz:—from \$25.00 to \$30.00 on purifiers and exhausts from rolls; and, from \$35.00 and \$50.00 for wheat cleaners and other purposes, to \$30.00 all around, including past use. On this basis all members of the Association who had been notified were able to obtain settlements.

For further information the Secretary recently sent out about 300 cards to millers in the Province with following questions:

"Total number of Dust Collectors in use for all purposes,....."

"Paid Maybee & Gearing Royalty on....."

"Dust Collectors....."

Replies were received to about 100 of these cards and the answers show as follows:—

26 millers paid royalties on 73 machines amounting to \$2469.12.

11 millers bought machines from licensed manufacturers and indirectly paid royalties on 30 machines, say \$750.00, (the balance of those who replied used other machines or else did not use dust collectors at all.)

Total amount ascertained to have been paid is approximately \$3219.

Another feature of the matter was developed from these replies, namely:

Four of the parties who replied were not members of the Association, and made their own settlements. They paid in royalties and costs \$981.00 for 19 machines, while the members of the Association who made their settlements after adjustment at \$20.00 each would have paid

about \$380.00 for the same number of machines, showing a difference of \$600.00 in favor of united action.

Those who took the trouble to send in replies, only constitute about one-quarter of the millers in Ontario; and taking the results as fairly representative, we may estimate that the amount collected by Maybee & Gearing would be three or four times as much as the amount ascertained from replies. So that in all probability the Knickerbocker Co. were able to collect from \$6,000 to \$8,000 with very little expense or trouble by a good bluff.

Although the Knickerbocker Co. cite an English decision in their favor they do not mention the fact that their patent in the United States is disputed by the Vortex Dust Collector Co., of Milwaukee. The litigation is still pending and the solicitors of the Vortex Co. express themselves as confident of showing the want of validity in the Knickerbocker Co.'s patent.

Out of the correspondence that has taken place, our Secretary has obtained evidence from different sources showing that Dust Collectors were built on the same principle as the "Cyclone" both in the United States and Canada many years prior to the date of the Morse patent. This evidence is positive and beyond question.

Wm. Spider & Co., of Waterloo, had a "Cyclone" built for them by a millwright named Beerbohm ten years ago.

A. B. Barter, Medway Mills, London, helped to build a "Cyclone" as long ago as 1870.

Benjamin Barter, of Toronto, built a "Cyclone" Dust Collector in 1871, for the Polar Star Mills, Fairbault, Minnesota, and a letter written by him describes it as follows: "The Exhaust consisted mainly of an inverted cone about 5' 6" in diameter, having an opening near its periphery for the admission of the air and dust, and a small opening at the bottom part of the inverted cone for the dust to pass out to a spout, while a large opening in the centre, at the upper part, allowed the air to ascend and pass out. A fan operated in connection with the several burrs and the passages through which the flour chop was conveyed to the bolts for the purpose of drawing the hot air, etc."

Now compare this description with the specification made by Moore in his patent, as follows: "A Dust Collector composed of a conical or tapering separating chamber having a dust discharge opening at its small end and air discharge opening at its large end, and an inlet for the dust laden air connected with the large end of the separating chamber, substantially as set forth."

This is identically the same as Barter's except that Morse has added rotating arm or brush inside the cone for the purpose of deflecting the dust as it collects in the lower part. This is only an accessory to the main idea of a cone in which the air and dust are separated, by centrifugal force, and retarded motion, the air escaping upwards and the dust downwards.

Besides this evidence found in Canada, the Vortex Co. must have collected considerable evidence in the United States upon which they have carried on their contest. It appears from the data at hand that the Knickerbocker Co. have succeeded in collecting large sums of money from the millers in this country with scarcely any opposition and no test of the validity of their patent, owing entirely to the fact that no one man would undertake the trouble and expense of contesting a claim which was individually small, but which, if contested for all concerned, would have saved a large amount of money.

Some means should be devised by which better protection may be had against similar claims. It is pretty well understood that there was some years ago in our courts a case in which competing machinery manufacturers were fighting out the validity of a patent device; and when the patentees found that their opponents had secured fatal evidence against them, they negotiated a compromise, by which they were, for valuable concessions, allowed a formal judgment in their favor; thus establishing their patent when in reality it would have been declared invalid if the matter had been fought out to the end.

By this time I think the question has occurred to you, as it has to me, why should not this Association, as representing the milling fraternity generally, undertake the responsibility of protecting our interests in this direction.

It is in a matter like this, that our Association can be of the greatest assistance and benefit to its individual members. Let us insure ourselves against exorbitant and untenable patent claims, which are liable to arise.

I venture to suggest that if the Association has no fund at hand for such purpose it would be but a small matter to inaugurate a special fund, by a small assessment, for the purpose of contesting doubtful patents or similar claims. It would not cost much to retain some legal firm on behalf of the Association, who would be ready, at any time, to confer with the Executive Committee on such questions, and should litigation be necessary, the sinews of war would be provided in the manner I have suggested, with very little burden to individual members. At least we would have the satisfaction of knowing that we were in a position to fight for our rights, instead of tamely submitting, one by one, to the demands of peripatetic owners of doubtful patents.

THE PLANSIFTER SYSTEM OF BOLTING.

The manufacture of the plansifter in Canada has created interest in this particular system of bolting, and the subject was clearly dealt with in a paper by Mr. John Hodd, of Stratford, whose mill is fitted up largely with plansifters. The paper is as follows:

At the request of your honourable president I will endeavor to give you my views on the Plansifter Bolting Machine. I wish, before giving said opinion, to relate to you our reason for adopting the Plansifter. Years ago our company built a full roller mill, using the latest bolting devices known to the milling trade, which, you are at the time aware, consisted of hexagon reels, ranging from 16 to 18 feet long, and scalping reels from 4 to 6 feet long, running in connection with centrifugal reels, which were just being introduced to the milling public. As progress was made in the milling science, we adopted more reels of the latest and most improved pattern, until we had in operation 12 hexagon reels 18 feet long and 32 inches in diameter, 7 centrifugal reels and 7 scalpers 6 feet long and 32 inches in diameter. After running our mill steadily for eight years, the bolting department commenced to wear out and cause us a great deal of trouble and delay, also a great loss of time and money, owing to this disadvantage. Our company concluded to investigate the different systems of bolting in use, with the view of adopting the most perfect system. In the course of our investigations we were advised to look over a Plansifter mill, which we hastened to do, and after a careful investigation we concluded to adopt that system of bolting, and accordingly on the last of December, 1893, we shut down our mill, and at once proceeded to put in five Plansifters, removing 24 old reels, and retaining two centrifugals. We had our mill again running on February 6th, 1894, or in about five weeks from time of shutting down. After starting up we found that our flour was more granular, was of equal, if not superior color, giving a much whiter loaf, and that our yields had improved and capacity increased 75 barrels, using the same roll surface and with less power, all of which is due I think to the superior work of the Plansifter, which causes the light or fluffy material to float on top, and the heavy particles to drop to the bottom, thereby causing the flour to be sent direct to packer, avoiding all re-bolting. I might add that we have found that our present grade of flour will produce more pounds of bread per hundred of flour than our old, owing to its being free from fluff and dead flour. As regards our reduced yields, will state that the middlings coming from the Plansifter are practically free from woody or fibrous particles, and must of necessity grind easier, and cause better separations, enabling us to send any impure stock direct to the tail end of the mill for treatment, and avoid any overloading of our rolls. All pure stock is reduced to flour before it reaches the low grade rolls, these rolls have only the woody and fibrous stock to handle, this stock is sent direct to centrifugal reels, where all flaky stock is broken up and dressed into low grade flour, averaging 4 or 5 per cent, running on average yields of 4 2/4 (farmers' and car wheat per barrel). In my opinion one reason for the saving in power is owing to the superior condition in which the stock comes from the Plansifter and goes into the rolls to be ground, as it enables you to grind high and still produce good yields, another is that the Plansifters themselves run very light, in fact one of our machines doing all the scalping, grading, and flour dressing for 350 barrels. The first, second and third breaks do not take two horse power. In my opinion the superior points in the Plansifter over any other bolting device consists in the following: larger capacity, saving of space, saving of power, makes sharper flour, makes whiter flour, sends middlings direct to rolls and purifiers without the use of conveyors, it handles each break and reduction separate allowing none to mix, can be used equally well on hard or soft wheat, easy manner in which it can be controlled on any class of wheat. I have been asked the question a number of times in regard to the machine shaking the mill building. In reply to these questions my answer is this, that they do not shake it any more than the old style long geared reels, and if they are in balance, the shake cannot be felt to any extent, the shake, when there is any, is a swinging shake and does not have the harmful effect on the building that the jarring of the old style machine had.

I will not take up your valuable time any longer, and will close by extending to you, one and all a special invitation to call and examine our Plansifter mill at work.

ELECTION OF OFFICERS.

At this point in the proceedings the election of officers for the new year was proceeded with, resulting as follows:

President—H. Barrett, Port Hope.
First vice-president—Alexander Dobson, Beaverton.
Second vice-president—James Hodd, Stratford.
Treasurer—William Galbraith, Toronto, (re-elected).
Representative of Industrial Exhibition Board—John Brown, Toronto.
Executive Committee—J. L. Spink, Toronto; J. D. Saunby, London; A. H. Baird, Paris; M. McLaughlin, Toronto; James Hodd, Stratford; Robt. Noble, Norval; John Goldie, Ayr.

Board of Arbitration—James Stark, Paisley; John Galbraith, Allandale; James Goldie, Guelph; J. C. Vanstone, Bowmanville; W. J. Baldwin, Aurora; Geo. Hamilton, Toronto.

WHEAT BUYING AND PRICES.

A discussion on this question, which is a very live one at present with millers, was led by Mr. T. O. Kemp, of Seaforth. He expressed the opinion that the system of buying by standard, adopted by the Association some years ago, had served its purpose. It was formulated at a time when \$1.00 a bushel was being obtained for wheat. It had also served the excellent purpose with the farmer of improving the quality of the wheat. As prices ruled to-day, however, the adoption of that system meant that the miller was paying, in most cases, a premium per lb. for his wheat. He could not afford to

do this. Mr. Kemp was of the opinion that the time had arrived when the system of buying should be changed to a percentage system, as the only fair method alike to miller and farmer. He had carefully worked out what this change would mean to all concerned, and gave to the meeting several practical illustrations. In all cases he contended it would be giving the farmer every cent that the wheat was worth.

The remarks of Mr. Kemp provoked a good deal of criticism. Mr. James Goldie, of Guelph, was of one opinion with Mr. Kemp in the matter. He said it was folly for millers to go on buying under the standard system. Mr. J. L. Spink said he had not bought by the standard system for some time. His buyers examined the wheat sample and judged its price, and offered the farmer so much per bushel for it whether it weighed 60 lbs. or 61 lbs., or otherwise. Mr. A. H. Baird and others were strongly of the view that it would be unwise, after all the labor that had been expended in getting the standard system accepted by farmers, to disturb matters at present. Mr. M. McLaughlin apparently voiced the view of many when he said there was one safe rule only to be followed and that was the one enunciated by Mr. Plewes at the afternoon session, namely, in no case to pay for wheat more than the export price. Millers could not hope to succeed by adopting any other method.

The proposition of Mr. Kemp was put to a vote, but did not carry, though members agreed with much that he said and admired the care and thought he had given the question.

The full programme having been carried out almost in its entirety, another successful meeting was brought to a close at 10:30 P. M., so far as business was concerned.

CANADIAN MILLERS AT PLAY.

There dwelt a miller hale and bold
Beside the river Dee;
He worked and sang from morn till night,
No lark more blithe than he,
And this the burden of his song,
Forever used to be,
"I envy nobody—no, not I,
And nobody envies me!"

So pleased were the members of the Dominion Millers' Association and their friends with the outing of a year ago, which took the shape of a trip to Niagara Falls, by the beautiful steamers Chippewa and Chicora, and the new electric railway, that there was a very general request that the trip should be repeated again this year. Consequently the programme of the second day of the annual meeting was fixed to be an excursion to Niagara Falls. Some by the 7 a.m. boat and others at 9 o'clock—millers and their friends to the number of upwards of 100 proceeded to the Falls on Wednesday, Aug. 8th. With the exception of a slight sprinkle of rain the weather was delightful, and the manner in which millers enjoyed themselves seemed to show that "no lark more blithe than he" is to be found anywhere than the Canadian miller when he is off for fun.

On the arrival of the party at Niagara Falls dinner was served at the Dufferin Cafe, where complete arrangements had previously been made by Secretary Watts, who was on hand early to see that members received careful attention. Needs of the inner man having been satisfied, the excursionists proceeded to enjoy themselves generally by seeing some, at least, of the many beautiful sights of the Falls, which people never seem to tire of.

VISITING UNITED STATES MILLS.

It had been arranged by the Secretary that Canadian millers might visit the two large mills, among the largest in the Eastern States, situated at Niagara Falls, N.Y., and many millers took advantage of the opportunity to see how their American cousins conducted affairs and in what way the American "dusty" was different from those who plied their trade within the Queen's domains. The capacity of the mills visited is about 2000 bbls. (each) daily. Every attention was paid the visitors by the managers of those two large concerns. "In fact, just you say," said Mr. James Goldie, of Guelph, to a representative of the CANADIAN MILLER, "these Americans have treated us in the whitest manner possible. They showed themselves good fellows and they have our very best thanks and appreciation for the trouble they have taken upon themselves during the time of this visit." There is no doubt that from a trade standpoint

the visit was profitable, just as from the social point of view it was enjoyable. Canadian millers received pointers from what they saw, and if they are able to introduce any improvements or new notions into their mills on their return home, they will have to thank the firms of Schoellkopf & Mathews and The Central Milling Co. And we are sure that no one will be more delighted to know that information has been imparted than these representative American millers.

At 4.15 p.m., the party again took the Niagara Park and River Railway for Queenston, there boarding the Chippewa, reaching the city about 8:30 o'clock, having had a jolly time.

TALKS WITH MILLERS.

"Managing to keep the sheriff out—that's about the most millers can hope to do these times," was the reply of John Brown, of the Citizens' Milling Company, to my enquiry of the day, "How is trade?"

Mr. David Plewes, the old-time Secretary of the Dominion Millers' Association, was a prominent figure in the meeting. As is generally known Mr. Plewes has spent the past two years and more in Great Britain, representing a syndicate of Canadian millers. His return at the present time is due to the depressed condition of the flour market in Great Britain. He does not at present see any way out of the woods, certainly not so far as Canada is concerned, until more favorable through freight rates for flour are secured, and millers buy wheat at an export price.

I had a few words with Mr. J. D. Saunby, of London, who has recently returned from a trip to the Maritime provinces. "Trade is flat, very flat," said this well-known miller from the Forest City. "We can sell some flour, of course, if we are prepared to do so below cost, but for my part I see no fun in doing business in this manner. The fact is the millers of Ontario are acting like fools. Only to-day I received a telegram from a dealer in the provinces offering to place an order for flour providing we would drop our price to cents below suicidal figures already quoted." "Is there no remedy for the evil?" I asked Mr. Saunby. "Really, I don't see any relief," was the reply, "so long as millers will persist in doing business at a loss. Of course the strongest men cannot keep this up for ever."

"The trend of trade towards centralization," said Mr. James Stark, of Paisley, as I chatted with him on the way home from the excursion on Wednesday, "is being felt in Canadian milling to-day as it is in almost every branch of trade. In the city here the small tradesmen know how the big bazaar stores are cutting into their trade. The small manufacturers of various articles all over the country know how the large combinations and consolidations are affecting business with them. It is hard for the small men to compete with these big fellows. We are seeing the same thing growing in milling. There are large milling concerns in this country doing a business that might be represented by 200 small boss millers. They manufacture at a cost that the small man cannot touch; they possess advantages in selling their product; their large output enables them to secure special rates both on the product going out and the wheat coming to the mills. How are the small mills to meet this evolution in trade is a present-question. And yet I believe that the small mill is a necessity to the success of the country and the small miller will still, somehow, manage to fight his way."

Mr. Charles Smith, of Campbellford, is one of the men who does not believe in helping railroads. Enjoying the lake breezes, and they were at their best at that hour, on the hurricane deck of the Chippewa, as we were homeward bound from the millers' outing he conversed freely of railroad freights. "How we are going to remedy the trouble," he said, "I hardly know. We must all recognize the power that railroad corporations possess and how they can manipulate governments, and I believe, too often, individuals to meet their own ends, and yet we have got to fight this. It is amusing, when these railway managers are brought to book about discrimination in freight rates, for them to tell us that there is a millers' rate. Of course there is a millers' rate, but there are rates and rates. The millers' rate, unfortunately, is not the best rate the railroads are ready

to give, if you know enough to get after them for something better. Take a case of some 17,000 bushels of wheat, that I bought some time ago, to be delivered at my mill as I might want it. Within the past few weeks I sent west here for a portion of that shipment to be sent me. The rate was 6 cents to Campbellford. Brokers tell us that they are not making any commissions these days on wheat, so I suppose they must get a living in some other way; at any rate this wheat was sent forward to me at 3c., just half the rate. The railways certainly broke their rates and I suppose the margin, or part of it, at any rate, helped to make up the broker's commission, not so obtainable at present prices. When one sees the inside of this freight trouble I confess it annoyed me to see the Association anxious to put themselves about at all to obtain any special legislation for the railways. Let them fight their own battles. We have got our hands full."

SCRIBE.

IMPRESSIONS.

What would the Dominion Millers' Association be without its able and indefatigable secretary, Mr. C. B. Watts? The position of the Association to-day illustrates its success under his capable management. There is no flattery suggested in the interrogation, for at different points in the meeting on Tuesday the 7th, it was evident that not only has the secretary the confidence of the entire membership of the Association, but he has their sincere admiration and appreciation, and he deserves it all.

Editor Wrigley of the Canada Farmers' Sun was an interested visitor at the evening sessions of the Association. He appeared to be quite interested in Mr. Barrett's account of how millers had been caught through doubtful patents in milling machinery, and we are mistaken in our study of faces if he was not a good deal interested in the address of Mr. T. O. Kemp, and the discussion following it, on the price of wheat and a possible change from the basis of buying by standard.

While Mr. Plewes was warming up in his speech on the export trade in flour, Mr. J. L. Spink threw one of his little bon-mots, of which he keeps a stock in hand, into the discussion. Mr. Plewes was speaking with a good deal of vigor of the low prices that were being paid for wheat, when Mr. Spink took out of his pocket book a three line clipping, which he said he had received that day from his wife, who is visiting in Kansas. It read, that 35 waggon loads of wheat had been delivered that day at 35c. a bushel, and oats at 23c. "Canada is not a bad country to live in after all," remarked Mr. Spink.

The annual meeting was a success. Who will say nay? The attendance of members was perhaps a few behind a year ago, nevertheless the numbers ran into satisfactory figures, and those present were creditable and able representatives of the trade. The reports of the officers, executive, and freight committees were full of meat, and as given in full in this number of the CANADIAN MILLER ought to be carefully studied by every man interested in the progress of milling in Canada. They should, by the way, give suggestion to milling writers for various topics suited to these columns.

It was a pleasing break in the order of proceedings, that one or more papers on technical subjects were read before the Association. Previous programmes have been weak in this respect. Sometimes we are led to think that millers forget that there is a practical, as well as a commercial side, to flour-milling. Without any doubt the miller must watch closely the buying of his product for milling, and again the selling of it, for in both cases the cents in these days count. But the wheat that comes into the mill must be properly ground, if a successful and lasting trade is to be done, and whether this is so or not will depend on the methods employed. The papers of Mr. Barrett and Mr. Hodd merit the attention of all practical millers.

Allow us to throw off the innate modesty of a miller-editor and draw the attention of the trade of Canada to the very cordial resolution of commendation of the CANADIAN MILLER moved by Mr. M. McLaughlin, of Toronto, seconded by Mr. James Goldie, of Guelph, and passed at the afternoon session of the Association. The success of the milling trades are in no small measure wrapped up in the prosperity of a well conducted trade journal. The publisher of the CANADIAN

MILLER is sparing no effort to make this journal one worthy of the great interest it represents. How much millers may lose by not being subscribers is perhaps suggested by the story told by president Baird in his annual address of the farmer, who thought he would economize by stopping his newspaper, which had been costing him \$1.00 a year. Twenty-four hours had hardly gone by before he lost five times the amount through an error in a little transaction, because he had not his paper to keep him posted. We are modest enough to say that the suggestions and information that can be obtained in these columns in twelve months, for the sum of \$1.00, are worth many times the amount to every miller. Read the resolution that appears in the report of the proceedings.

The Association has, we believe, again made a happy choice of officers. Mr. H. Barret, of Port Hope, steps up from the first vice-presidency to the position of president. He got there as the unanimous choice of the Association, and will no doubt do honor to the office. In next month's MILLER we will publish a portrait and character sketch of the new president, when more will be said about him. In Mr. Alex. Dobson, of Beaverton, and Mr. James Hodd, of Stratford, the Association secures the services of two of the most successful and capable millers in the province. They are new men on the executive and will bring strength to it. Two other new faces, that will appear at future meetings of the executive, will be Mr. Robt. Noble, of Norval and Mr. John Goldie, of Ayr. The former is one of the solid, prudent, level-headed millers of the country, whose councils are always sought after and followed. The latter is the son of one of the veterans of Canadian milling, Mr. David Goldie, of Ayr. He is a young man and an active member of the recently organized Goldie Milling Co.

IN RUSSIA.

RUSSIA is a country of queer things. A St. Petersburg letter says: "It seems almost incredible that a people who, two years ago, were suffering all the horrors of famine and publicly offered up prayers to the Almighty for an abundant harvest, should now consider measures for the purpose of counteracting the effects of the wished-for blessings. But it is none the less true, and, stranger still, some papers in reply to the question, 'Should the corn be reaped?' have deliberately given it as their own opinion that, for numerous districts, it would be advisable to leave the corn standing. Nay, more it now appears that many landowners refused even last year to gather in the harvest and are determined not to remove it this year either. One landlord, for instance, who owns a large estate near Odessa, and whose facilities for export are, therefore, very numerous, foreseeing the fall of prices, purchased 1,000 sheep and unhesitatingly turned them into his field of wheat. He is said to be so satisfied with the results that he meant to do the same this year, now that a further fall in price is probable." On the same subject the Novosti, Odessa, says: "It would be tantamount to throwing good money after bad to gather in the harvest this year, for it can only be done at a heavy loss to the farmers. A pud (36 pounds) of barley, for instance, costs the producer 36 1/4 kopecks (18 cents) before it is shipped at Nikolaieff; the price per pud at that port, is, at present, only 34 kopecks, and and is bound to become less as soon as the abundance of this year's harvest is made generally known."

EXPANSION OF CYLINDERS.

MUCH trouble is experienced in long stroke engines by the cylinder working loose on the foundation, caused by expansion in the cylinder body from the heating of the steam. Various means for overcoming this have been adopted and the most satisfactory seems to be to fasten one end of the cylinder solid to the foundation and leave the other end free to expand endwise, but of course prevent from vertical motion by the proper appliances, in other words, have a sliding expansion joint at one end. In tandem engines where one cylinder is fastened to the other direct, that is, the back end of the first to the head end of the next, this expansion is something considerable and should be provided for. This expansion can be diminished by not connecting the cylinder as first stated, but connecting the head of the first cylinder to the head of the second by rods running outside of the smaller cylinder.



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—BY—

C. H. MORTIMER

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THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

AN EXAMPLE TO OTHER WORKMEN.

ONE of the happy conditions of the milling trades generally is the satisfactory relations that exist between employers and employed. The world of labor almost everywhere evinces a spirit of troublesome unrest. A reference to the events of the past few months, and to instances just as distressing, dating not far back of the great railway tie up, furnish illustration enough on this point. But the head miller and his associates go on their way undisturbed, carefully minding their own business. Analyzing the well-known character of millers, whether proprietors or workmen, we may perhaps attribute this enviable condition of affairs to an innate contentedness and a common-sense way of viewing business matters. The miller can afford to hold firm to this position, for there is need that some body of workmen should stand out in contrast to those who essay to-day to be leaders in the ranks of labor.

Unfortunately labor disturbances are like the rain from the heavens above; they fall both on the just and the unjust. If the results of strikes could be confined only to the particular trades directly interested, serious though these would be, we might be satisfied to withhold unfavorable comment. But the loss and trouble strikes others as badly as these do the workmen themselves who are the instruments of the strike. The outcome of labor strikes, whether in this country or abroad, furnishes stronger reasons for the abandonment of these methods of removing labor troubles than it does for a further pursuance of them. Workmen might profitably come to the conclusion of their unfortunate and wild-headed leader, Debs, that they will never again have anything to do with leading a strike.

An able and comprehensive review of labor troubles, written by the Hon. W. P. Reeves, Minister of Labor, New Zealand, throws clear light on this phase of the question. Quoting data from English, American and Antipodean sources to substantiate the statement, he remarks "not many labor victories are complete enough to reimburse the men the hard cash they are out of pocket through a long spell of inaction. The cost of strikes are frightful, their waste deplorable. What is to be said when this price is paid, not over victory, but over defeat and humiliation when after all these sacrifices workmen see their cherished union shaken and discredited; their leaders, it may be, in prison; their places taken by the hated black legs; their families eating the bread of charity; themselves driven out to wander and beg for the work they renounced." Mr. Reeves says that after all the strike or lock-out only proves which side is the stronger, not which is right. Employers have yielded to unfair demands simply through fear of loss by stopping their works. Quite as often unions have not dared to press home fair requests through their inability to face the lock-out, or the summary dismissal of their leaders. It may well be asked if a method of

settling labor troubles, that does not produce greater results than these, should not be abandoned for something more business-like, rational and in keeping with the progress of the age.

WHEAT CHANGES.

THE indications are many that methods of farming on this continent are undergoing a number of changes. Various commercial conditions have led up to this point, but doubtless first among these is the continuous depression of the wheat market. In Ontario what with the loss of the barley trade, caused by the McKinley bill, followed by the low price of wheat for the past two years, something had to be done, and we find our farmers entering largely into dairying, as one means of relieving themselves from the loss of trade that had resulted from the changes in the barley and wheat markets. Others, both here and in the United States, have been studying the question of feeding wheat to hogs, in place of selling it in the customary channels of trade. Figures previously given in these columns have shown that there has been during the past year no small part of the wheat crop ground up by millers for feeding purposes. How far wheat becomes a profitable food for hogs is another question that farmers must intelligently solve if they intend to use the grain in this manner. Investigations are now being made at different experiment stations in various states with the view of ascertaining how far wheat may be fed to hogs with profit to the owners of these animals. In South Dakota a result of these experiments has been given forth and would indicate that whilst wheat can be fed profitably as an entire ration to hogs, it would pay better to mix it with some other food, particularly during the early stages of fattening. Hogs fed on ground food make a more rapid and more uniform gain and produces pork of rather better quality, but they also consume more wheat than those fed upon the whole wheat. Other questions, bearing chiefly on the quantity of pork produced, when fattening begins and how long, are brought out in the investigation, but so far as the main enquiry is concerned it would give strength to a growing opinion that a better price will be netted the farmer, as prices are running these days, for wheat fed to hogs than sold for flour making. It ought to be a good thing for the farmer if he can find a new outlet for his crop through the hog. This circumstance, combined with a tendency to curtail wheat-growing, ought ultimately to result in bringing up the general price of wheat to a better figure than has prevailed for some time. We are at a period in wheat growing when considerable changes will be made. As we have remarked more than once millers are largely concerned in the evolutions of the wheat market and the intelligent miller will give his best thought to these changes of the times.

THE FACETIOUS SIDE OF WHEAT.

GROWING discouraged in the effort to bring wheat prices up to anything approaching a decent level of former figures, some of our cotemporaries are beginning to treat the question facetiously, and if they cannot join with President Van Horne in fixing \$2.00, or yet \$1.00 for wheat, they are at least going to have some fun out of the business.

These are not the days that create wheat kings like "Old Hutch," of Chicago wheat pit fame. The times are such as would test the ingenuity of a brighter man than even he in an effort to run prices up a single notch, much less a jump of say 40c., as had been done on one memorable occasion. With wheat in Chicago hanging around 50c., this kind of work is out of the question.

Looking at things in this light we find the Montreal Trade Bulletin, for one, amusing its readers with a dissertation on "That Poor Old Hack Wheat," as follows: "The amount of confidence still placed in the recuperative powers of that poor old broken-down, sore-footed horse called wheat, is really marvellous. Because it has performed some fast pacing under the jockeyship of Jack Sturgess, Jim Keene, the Cincinnati barber, and the renowned Hutch, the great crowd of speculators are all betting on its capability of doing some other wonderful feats, and margins are all up, expecting the old nag to get away in fine style and make some money for them. The stubborn old brute, however, continues to

make starts after starts, as though it meant business, but no sooner is it off on a canter and making headway than it pulls up broken-winded, and walks back to the starting point."

EDITORIAL NOTES.

OUTSIDE of the foolish young lads, who have visited the Peel county pool room, where the gambling has been on horse flesh, chiefly, we do not hear of any extravagant losses from this habit in Toronto, though, doubtless, losses are made, that are kept dark. Doing things up on a larger scale, Montreal seems, relatively, to be as much given over to gambling in grain as Chicago. The death of a prominent citizen, in the person of Mr. James Burnett, who died suddenly a few weeks ago, has brought out the fact that an estate that would have realized, likely, not less than \$1,000,000 has been discounted to the extent of \$200,000 through losses in wheat speculations made by Mr. Burnett. His is by no means an exceptional case, if all we hear from Montreal is correct.

AN outcome of the discussion that has been conducted in these columns regarding flour trade with the West Indies has brought forth the suggestion that it would be a practical step towards a development in trade with these colonies if the government were to appoint an officer who might be known as Agent-General for the Indies. There are now at certain points in the Islands officers, who, to some extent keep track of the conditions of trade, but their work is hardly continuous enough. What is wanted is one who will give careful thought to the needs of the colonies, watch carefully the imports, and adopt means to direct these to as large an extent as practicable into Canadian channels. It seems quite likely from what we know of the flour trade in the Indies that an officer who understood his business could materially help to direct greater attention to Canadian flour and to adopt means to wipe out any prejudice that to-day may be a drawback to doing as large a trade in flour as might be done.

OUR friend, N. H. Stevens, of the Kent Mills, Chat-ham, has uttered the prediction that the ruling price for the new wheat crop will be 50 cents per bushel. He considers dealers have been paying far in excess of the price warranted by the market, either present or prospective. This well-known and level-headed miller of the west is not alone in this view of wheat prices, whilst of course there are others who do not give way from their prediction that before very long we will really touch \$1.00 for wheat. On this point, as a contribution to the argument, each one to take it what way they will, it is to be noted that the amount of wheat and flour on passage to the United Kingdom and the continent increased for the last week in July nearly three million and a half, from 82,628,000 bushels to 90,088,000 bushels, a figure that makes the total in sight come up to within 5,926,000 bushels of that of a year ago. If the new crop is to be as large as appearances would indicate just now, we are certainly not going to be short of wheat.

AT various times the grain and milling trades have not escaped the evil of adulteration. The baker has learned that it was not all wheaten flour he was making into bread, and we do not know that he has been so sinless, that he has not himself had a knowledge of the art of adulteration. It is a peculiar condition, however, to write of wheat, the most valued of all grains, at least this was so at one time, as being itself used for purposes of adulterating some of the minor cereals. It is stated on the authority of the National Stockman that since the price of oats has been comparatively higher than the price of wheat, the products from oats have been adulterated by mixing them with the products of wheat. Some of the manufacturers of oatmeal, it is reported, have been buying large quantities of wheat recently for the sole purpose of increasing the weight and cheapening their output. Chops and other of the by-products of wheat are being used in commercial foods to-day placed on the market. It was a terrible insult to wheat when we commenced to feed it to the hogs, but the descent is surely still greater when it commences to serve the ignoble purpose of adulteration.

VIEWS AND INTERVIEWS.

Where Australian
Millers are Behind.

Millers at the antipodes are recognizing that they are behind the times in labor saving machinery. The Australian Miller says: "The low price of wheat this year has forced on our notice the fact that, if wheat-growing in Australia is to pay, we must adopt more efficient and less wasteful methods of farming and of handling the grain. In a country like ours, where the heavy cost of labor is the chief obstacle to the rapid development of the various resources of our vast and sparsely inhabited continent, it is reasonable to think that we should evolve, an aptitude for inventing labor-saving devices, or, at any rate, that we should adopt the labor-saving devices which have been found to work well in other parts of the world."

Where Corn
is Indigenous.

Dr. John W. Harshberger, in an interesting study on maize corn, traces its origin to the highlanders of Mexico, between the 21st and 22nd degrees of north latitude, from whence it spread through the agency of the tribes of Northern Mexico, and possibly by the way of the West India Islands also, into the area included by the United States. Following down the Isthmus of Panama it extended southward along the great Ardean system, where we find tribes in no way related borrowing the name as well as the cereal itself. Maize was not introduced directly into the West India Islands from Mexico, but probably through South America. This is inferred from the fact that South American words designating this grain extended all through the West India Islands. These conclusions in regard to the introduction of this cereal north of Mexico are contrary to the generally accepted idea that the Caribs introduced it into Florida.

Scientific
Milling.

The real science of milling, says a writer in the Modern Miller, consists in removing the husks of bran from the berry without cutting it up and reducing it to powder so that it all can be removed from the flour, and that the taste, whiteness or nutritive properties of the flour may not be interfered with. So important is the thorough purification of middlings still considered, that scarcely a week passes in which there does not appear some new-devised machine. Many of these cannot bear the test of practical use; others are but a slight alteration of some machine already in use, but oftentimes the patents issued represent considerable original experiment on the part of the inventor. When we look over the panorama of machines which have been brought before the milling public, however, we find that although many times there have been radical deviations in all directions, after all we have returned to the original principles.

FLY WHEELS.

FOR convenience of those designing or buying steam engines, we give herewith a table applicable to engines of various horse powers, of different speeds, and from which the required weight of fly-wheel rim in pounds may be got by dividing the number given by the diameter of wheel decided upon. The larger the wheel the less rim-weight it needs.

TABLE FROM WHICH TO GET WEIGHTS OF FLY
WHEEL RIMS.

REVOLUTIONS PER MINUTE.				
H. P.	60	70	80	90
	Constant	Constant	Constant	Constant
25	45126	33163	25391	20111
30	54152	39796	30469	24133
40	72202	53061	40625	32178
50	90253	66327	50781	40222
60	108303	79592	60938	48266
70	126354	92857	71094	56301
75	135379	99490	76172	60333
80	144404	106122	81250	64365
90	162455	119388	91406	72400
100	180505	132654	101563	80444
125	225631	165816	126953	100555
150	270758	198980	152343	120666
175	315884	232143	177734	140767
200	361010	265306	203135	160888
225	406136	298469	228516	180999

TRANSPORTATION AGAIN.

MR. CAMPBELL'S FIGURES AND VIEWS ATTACKED BY
MR. PRINGLE, OF STRATFORD.

IN reply to the position taken by Mr. J. B. Campbell, of Montreal, whose several papers on transportation and wheat prices have appeared in these columns the Globe of recent date publishes the following vigorous rejoinder from Mr. Jas. Pringle, of Stratford, Ont.:

I have read several long letters in your valuable paper from Mr. James B. Campbell, of Montreal, advocating the deepening of the St. Lawrence and also of the canals to a depth of 22 feet, so as to enable large vessels to load Manitoba grain at Fort William or Duluth direct to Liverpool, or to any European port, without breaking bulk. This, he claims, would reduce the cost of carriage so much that it would make farming in Manitoba and the Northwest profitable, which would have the effect of populating the country, and of enriching Ontario and the rest of the Dominion, as well as Montreal and himself, instead of building up New York State and city, and allowing the profits of the Manitoba grain trade to go into the pockets of a New York Syndicate as at present. It is very doubtful if the syndicate or the profits exist anywhere but in the imagination of the writer.

Mr. Campbell has informed his readers that he has been fifteen years a member of the Chicago Board of Trade, and wishes it to be inferred from this fact that he knows all about grain and the grain trade, but it does not follow that he does. There is no class of men on the face of the earth engaged in the grain business that know so little about the quality or the business they are following than nine-tenths of the members of the Chicago Board of Trade. One man who has made millions during the last few years does not know spring wheat from fall, oats from barley, or peas from beans. As far as the knowledge of the value of grain is concerned the majority of members, to use a common expression, "don't know beans."

Mr. Campbell may be an exception, but it appears to me that he does not know quite as much about the intrinsic value of grain or of the grain trade as he professes to do, and it will be well for the different Provinces to think twice before consenting to put another mortgage of \$100,000,000 on the country for the doubtful experiment of making wheat growing profitable and building up the trade of Montreal. Mr. Campbell forgets that the natural highway to the English market he speaks about is frozen six months in the year, no matter how deep the water is. Besides it is not long since we had a visit from Sir John Thompson. In speaking about the grain trade he predicted that in ten years from now the Americans would not be able to grow enough wheat to supply their wants, and that it was only a question of time when they would have to depend on the Canadian Northwest for their supplies. If this prediction comes true the depths of water will be quite sufficient for the requirements of the country. Mr. Campbell seems to overestimate both the productiveness and the quality of the grain. It is true Nos. 1 and 2 hard command a big premium this year over other varieties, both at home and abroad. But Manitoba has been shipping wheat east for the last ten years. During this time she has shipped much soft and unmerchantable wheat, as well as much Nos. 1 and 2 hard. Mr. Campbell is mistaken if he imagines Nos. 1 and 2 hard are equally valuable one year with another. This season it is worth at least ten cents per bushel more to the English miller for mixing purposes than the same grades were two years ago.

MILLERS MUST EXPERIMENT.

It takes time for millers to find out the qualities of each year's crop, hence the reason English millers have increased the premium on this year's crop. A few years ago Manitoba dealers found a good market for frozen wheat from Ontario millers. To-day no miller who has any regard for his reputation will allow it in his mill at any price. In a year like this, when the bottom has been dropping out of the wheat market, it is unfair to quote the selling prices in the English market on certain dates and Manitoba prices at the same time, it being much easier to quote prices than it is for shippers to realize these prices six weeks or two months afterwards. If Mr. Campbell wished to be fair to Manitoba grain-dealers he ought to have quoted the prices paid during October, 1891, for wheat that did not stand the inspec-

tion, and the prices realized in the English market two months later. It is well known that large quantities of wheat were shipped that season that scarcely paid the freight. If dealers save themselves this year from loss it is simply because the crop is so small and the quality is so good. Supply and demand regulate prices. If Sir Charles Tupper's prediction had come true, and Manitoba had been raising a surplus of 640 millions of hard wheat ever since 1890, instead of wheat being 45 cents it would now be worthless. There is no sense in advocating at present increased production of an article that is now below the cost of production, either in Manitoba or elsewhere. It is an easy matter to quote figures holding out great inducements to lead the people astray. From 1855 to 1875 the counties of Perth, Huron, Bruce and many others raised nothing but the hardest kind of Fife wheat on account of its proof against rust. In one of these early years I arranged to supply a miller in the State of New York, but he soon discovered the wheat was harder than the stones he had for grinding it, that is, that his millers, instead of making flour, had to be dressing stones the greater part of their time, and he concluded to get his wheat elsewhere. During this period farmers had no trouble in growing from 25 to 35 bushels an acre. Since that time the wheat has refused to grow either on the richest old land, or in the newest of the new. It is hard to say how soon it may give out in Manitoba, when the present premium would cease.

THE GRAIN DEALERS' METHODS.

Mr. Campbell is unnecessarily concerned about the welfare of Manitoba and her grain dealers. It is to be presumed the grain men know their own business. I am told several of the leading firms have formed a syndicate, and are pooling their purchases, one firm being stationed in New York, whose business is to sell the wheat on its merits either in New York, in the English markets, or on the continent of Europe. In view of the fact that the syndicate have to compete in buying against the Ogilvie Milling Company, the Keewatin Milling Company, and all the rest of the milling companies, there is not much danger of getting hard wheat much below its value. Mr. Campbell laments that Manitoba sends her wheat so far round about at a greatly increased cost, to be at last slaughtered in New York.

This shows plainly that Mr. Campbell has never studied the geography of his own country. The distance from Buffalo to New York is very little over 400 miles; from Port Colborne to Montreal is 425; Montreal to Portland is 287; to Boston 335, and to Halifax 756 miles, which shows plainly that Manitoba is using the direct route to the seaboard, to the port where she gets the best service and by far the cheapest freights the whole year round. It has been the experience of farmers and grain dealers during the last 35 years, that the sooner wheat was marketed after harvest it proved the most profitable nine years out of ten. This holds much more so in Manitoba, where snow drifts penetrate right through the stacks and destroy the grain, and the weather is so cold that thrashing has to stop. For this reason large quantities of grain will always be coming down at the close of navigation. The syndicate prefer Buffalo, because the grain can all be promptly unloaded. Supposing the canal is closed there, and a great many railways ready to compete for the carriage to New York at a very little over canal rates; time having been money in grain the last three years the sooner it reached the market the better.

Mr. Campbell surely would not expect shippers to be so foolish as to run the risk of having their property stuck at Port Colborne, Kingston, or even Montreal, and then have to pay two or three times more freight to Portland and Boston than by Buffalo to New York. Manitoba is not so badly in the hole as long as the New York route is opened to her. I find the rate from Duluth and Fort William to Buffalo is only 2c; from Buffalo to New York is 3c. This is surely cheap enough. But the chances are that as soon as canal boats are propelled by electricity, the same as trolley cars, freights will get much lower. Just think of a trolley taking hold of eight or ten boats and towing along at the rate of six or eight miles an hour! This will make the cheapest kind of transportation on the face of the earth: besides, the chances are before long the power that propels the boats will be made to keep the canal from freezing. If such is accomplished Mr. Campbell may as well give up his wild and expensive scheme.



Office of the CANADIAN MILLER,
August 10, 1894.]

THE GENERAL SURVEY.

WHAT are we to say of the trade conditions of the month that can be of timely interest to anyone interested in the selling or buying of grain? The conundrum is more difficult to solve than any of the Humpty-Dumpty riddles of childhood. The whole situation might be sized up in the words: Stocks and more of them than anyone wants; prices lower than anyone cares to sell for. The whole trade more stagnant than ditch water.

Things must be kept moving, however, somehow, and consequently thought has to be given to conditions as we meet them each day, though these may only be a repetition of yesterday. And we must look a little into the future, notwithstanding that we do not see many rays of sunshine coming from that quarter. Prices continue to drop. Everybody supposed that was said for the last time a good many months ago, but the past four weeks have brought still newer surprises and the lowest figure yet has been reached. What next month will be it is hard to say.

There is a little freshness undoubtedly in thinking of what may be ahead as a result of the growing crop. Talking of home matters, we have given a good deal of space elsewhere to the reports of millers telling of the condition of the wheat crop in Ontario, and these would seem to tell us that we will be with the new harvest in about the same position as at a corresponding period a year ago. The acreage sown is rather less than a year ago, but there is an increase in yield that will make up for any deficiency in this respect. Manitoba and the Northwest are not likely to do big things this time. The crop will be an average one only, though there is this in its favor that it will be harvested perhaps earlier than any year since 1886, which means that it will be got in with perfect safety.

The crop of the United States is variously estimated at from 400 to 480 or 500 million bushels, but figures in the Republic have for some years been so uncertain that naturally any statement is taken with a good deal of distrust.

From foreign fields reports come to us of bountiful harvests in Germany and Austria. India will have a good crop. Weather conditions are not too favorable for the best crop in Great Britain. Bunching all reports together, however, it is not likely that the world will see anything touching the nature of a famine in wheat this year, which with the stocks on hand means still a heavy market and quite likely continued low prices. So much attention has been given to the Argentine wheat crop that the United States minister at Buenos Ayres has given special attention to an investigation of conditions in that country. He tells us that the last wheat crop was phenomenal in yield and the quality was particularly good. The acreage for this year shows an increase of over last year of about 20%, but it is not thought that the yield will be as great, so that in the opinion of this gentleman, it might be a safe estimate that the probable crop for export next year, would be only a slight increase in bushels over this year. If this statement is nearly correct Argentine will not be so strong a competitor as everyone has been counting upon.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—Winter wheat (old), 55c.; spring, 58½c.; No. 1 Manitoba hard, 70c. Trade Bulletin of Dominion Millers' Association says: "Fall wheat at 55c.; spring, 60c.; Manitoba wheat 69½c. west and 71½c. east. Offered new Fall wheat 53c., f.o.b., both roads." Montreal: No. 1 hard, 73c. to 74c.; No. 2 hard, 69c. to 70c. Chicago: quotations as follows—No. 2 spring wheat 52½c. to 53½c.; No. 3 spring wheat, 48c. to 51c.; No. 2 red 52½c. to 53½c. Buffalo: winter wheat, cash, 53c.; No. 1 white, 58c.; No. 2 extra

white, 57c. St. Louis: For cash 51¼c.; 52½c. for September; 55½c. for December; No. 3 soft, 53½c. Duluth: No. 1 northern, 54¼c. for September; No. 1 northern, 56c. for December. Toledo: No. 2, cash, 51¼c.; September, 52½c.; December, 55¼c. Minneapolis: August, 55½c.; September, 52½c.; December, 54c.

BARLEY—Toronto—Prices nominal; for feed quoted at 40c. Montreal: Barley for malting 50½c. to 52c. Oswego: Canada barley market reported very dull; prices nominal with few sales.

OATS—It will be learned from the report of Ontario crops published in another column that oats very generally are looking particularly fine. Toronto: offerings in different parts of Ontario are quite liberal. Old oats are quoted at 32c. west, new oats offered at 31c. Montreal: Per 34 lbs., store, 41½c. to 42c. Buffalo: No. 2 white, 37c.; No. 3 white, 36c.; No. 2 mixed, 34c.

PEAS—Toronto—The movement in new peas has apparently commenced and sales have been effected at 54c. middle freight. Montreal: for 66c. afloat, 73c. to 73½c.

RYE—Locally little doing. Sales of several thousand bushels at Buffalo have been reported at 54c. for choice and No. 2 at 52c. in store.

THE FLOUR MARKET.

IT is not an easy matter to report anything different to the dull monotony of low prices that has prevailed in the flour market throughout the year. Prices in fact vary a good deal, which is hardly evidence of a strong market. It is a case frequently of a desire to make sales at the best price that can be secured, but make the sale is the determination. Straight rollers of Ontario brands have been reported in Montreal at having been made at \$2.80 on track. United States flour is being offered in Montreal at \$2.60 in bond laid down. We hear of Ontario straights that have been placed for Newfoundland trade equal at \$2.70 on track at Montreal. There is no more encouragement at present to export flour than there has been for months. Conversation with Ontario millers bring largely the same reply that everything is dull, not excepting local trade.

PRICES OF FLOUR AND MEALS.

TORONTO—Flour: (Toronto freights). Manitoba patents, \$3.40 to \$3.60; Manitoba strong bakers' \$3.30 to \$3.40; Ontario patents, \$2.90 to \$3.00; straight rollers, \$2.65 to \$2.80; extras \$2.50 to \$2.60; low grades per bag, 85c. to 90c. Bran, \$13.00. Shorts, \$16.00. Trade Bulletin of Dominion Millers' Association, says: "Sales of straight roller, \$2.55 and \$2.60; 90% patents \$2.65 and \$2.75 and 85% patents at \$2.90; 80% patents, \$2.95; bran, \$11.00 and \$12.00; shorts, \$15.50 and \$17.50 f. o. b."

MONTREAL—Flour: Spring patents, \$3.40 to \$3.50; straight roller, \$2.95 to \$3.10; extra, \$2.50 to \$2.70; superfine, \$2.35 to \$2.45; fine, \$2.25; strong bakers', Manitoba, \$3.30; strong bakers', Manitoba, best brands \$3.40 to \$3.50. There is a fair demand for meal at firm figures. Granulated and roll, per bbl., \$4.50 to \$4.70; granulated and roll, per bag, \$2.30 to \$2.40; standard, per bbl., \$3.90 to \$4.00; standard, per bag, \$1.90 to \$2.00.

AN INSPECTOR'S EXPERIENCE.

AN inspector writes concerning an experience that recently befell him, as follows: "I had an experience a few weeks ago, which I should be quite reluctant to repeat under the same circumstances, if it could be avoided as well as not. I called to make an inspection at a stone works, where they have two boilers, but use only one at a time. The engineer was working at his two pumps, which he could not get to throw water, and was scolding because he had no steam to run with, although he had plenty only a short time before. The tubes in the boiler I was going to inspect were badly choked, and, in fact, nearly filled with soot from the coal. I thought that might be the trouble with the boiler they were using, so I opened the front of that boiler and looked into the tubes. They were red hot. I looked for the water. It was gone. I looked under the boiler to see the fire, and jets of burning gas were actually spurting out between the rivets on the seams over the fire. And the engineer was still work at his pumps, trying to get some water. I had a queer

feeling just at that instant. I got the engineer away from the pumps as soon as possible and had him draw the fire; and I could see the gas burning along the seam while the fire was being drawn. As soon as it was darkened in the arch a little, I could see that the sheet on the bottom of the boiler was red hot for a space of about three feet square. As soon as the boiler cooled down we opened the manhole, and found the inside to be bone dry. The outcome was that the seam next to the bridge wall was badly fire-cracked and sprung, so that a new sheet had to be put in. The tubes had all come out, and all the seams on the fire surface had to be re-calked; which I considered to be a very fortunate escape."—The Locomotive.

IMPORT DUTIES ON WHEAT AND FLOUR.

FROM a statement prepared by the British Board of Trade the London *Times* has compiled the following showing in English equivalents, the customs duties at present levied on imports of wheat and of wheat flour in the various European countries and in the United States of America. In most instances the duty is quoted per hundred-weight, so that if multiplied by four it would, in the case of wheat grain, fall just a little short of the equivalent duty per imperial quarter of 480 pounds:

Country.	Wheat Grain.	Wheat Meal and Flour.
Portugal.....	Prohibited.	Prohibited.
Spain.....	3s. 3d. per cwt.	5s. 4½d. per cwt.
France.....	2s. 10½d. per cwt.	4s. 6d. to 6s. 6d. p. cwt.
Italy.....	2s. 10½d. per cwt.	4s. 8d. per cwt.
Germany.....	1s. 9½d. per cwt.	3s. 8½d. per cwt.
Austria-Hungary.	1s. 6½d. per cwt.	3s. 9d. per cwt.
Greece.....	1s. 3½d. per cwt.	2s. 1d. per cwt.
Sweden.....	8½d. per cwt.	1s. 5d. per cwt.
Switzerland.....	1½d. per cwt.	9½d. per cwt.
Norway.....	1½d. per cwt.	8½d. per cwt.
Russia.....	Free.	1s. 11½d. per cwt.
Roumania.....	Free.	4s. 10½d. per cwt.
Turkey.....	8 per cent. ad val.	8 per cent. ad val.
Bulgaria.....	8½ per cent. ad val.	8½ per cent. ad val.
Denmark.....	Free.	Free.
Holland.....	Free.	Free.
Belgium.....	Free.	Free.
United States....	1s. ¾d. per bushel.	25 per cent. ad val.

"From this table it will be seen that Denmark, Holland and Belgium, like the United Kingdom, admit wheat and the flour of wheat free of duty. Russia and Roumania likewise admit wheat free, but they both place an impost on the manufactured product. In every case—with the exceptions of Turkey and Bulgaria—where there is a duty on imported wheat there is still a heavier tax on imported flour. Portugal, it will be noted, forbids importation either of wheat grain or of wheat flour save under certain conditions and restrictions. In France the duty of flour amounts to either 4s. 5¾d., or 5s. 5¾d., or 6s. 6d. A shilling (s) is equivalent to 24, and a pence (d) to 2 cents, according to quality. In Italy the duties on wheat and flour are provisionally in force in virtue of a royal decree, dated Feb. 21, 1894, but the sanction of Parliament has yet to be given before they can be definitely applied. The differences in the imposts of Sweden and Norway are interesting."

COMPARATIVE VALUE OF DIFFERENT BOILERS.

THE comparative value of different boilers has lately been a prominent theme at the meetings of different engineering associations, and much has been said in favor of those of water tube construction. In the advantages claimed for the latter stress is laid on the fact that when the circulation is efficient a rapid current flows through the tubes, producing a tolerably uniform temperature in all parts of the boiler, and there are no serious strains from unequal expansion—the small diameter of the tubes permitting the attainment of excessive strength over any desired ordinary steam pressure even with thin heating surfaces. As such boilers are also made in sections of moderate size they are easily transported and can be conveyed through narrow openings of buildings which would not admit of a fire tube boiler, and they may be fixed in confined spaces. As is well understood, the heating surface of such boilers is measured on the internal diameter of the tube; in a general way, one square foot of heating surface being required for the evaporation of two and one-half pounds of water per hour, and 49 square feet of heating surface for every 100 pounds of water evaporated per hour.

COOPERAGE D'P'T.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

COOPERAGE FACTORIES CLOSING DOWN.

Much interest in cooperage circles has been stirred up through a meeting of dealers and manufacturers of cooperage stock in Chatham a few days after the last issue of the MILLER had gone to press.

There were present: Mr. Buchanan, of Buchanan Bros., Staples; J. S. Ainslie, of J. S. Ainslie & Bros., Comber; Mr. Gordon, of Steinhoff & Gordon, Wallaceburg; Smith Bros., of Quinn; S. J. Sutherland, of the Sutherland, Innes Co., limited; H. Morris, of Wallaceburg; H. H. Shaver and J. P. Middleton, Eddy's mills; C. E. Naylor, Essex, D. P. Sicksteel, J. Groesbeck and Mr. Decew, Essex.

It is to be remarked that the main home of cooperage manufacturing is in the vicinity of Essex, Kent and Lambton. At one time there had been in existence what was known as the Canadian Cooperage Association, but apparently having served its purpose it had passed out of existence. One step taken at the meeting on motion of Mr. Gordon was to plan the re-organization of the Canadian Cooperage Association. On the question of organization Mr. Morris, who occupied the chair said: "You will observe that in the business world, men are ever found binding themselves together for the purpose of bettering their conditions and protecting their interests. We see that even labor has bound itself together under a definite name, and I think that the important industry of cooperage and that particular branch of the trade involved, ought certainly not to be behind the times."

Mr. Gordon supported the chairman's remarks in these words: "I think it would be to the best interests of the society to thoroughly re-organize. For a long time there has been no question of importance enough to require our attention; the present situation in which our neighbors on the south are placed, however, will alone warrant us in taking such steps as will enable us to protect ourselves. It has long been my opinion that if those interested in the cooperage business would work more together, the benefits derived would soon manifest themselves, and I think it will be more advantageous to re-organize ourselves, even with a small membership, than to possess no organization at all."

Mr. Decew, Mr. Ainslie and Mr. Sutherland each followed in similar strain. The discussion being followed up by a resolution, which was unanimously carried, Moved by Mr. Sutherland, seconded by Mr. Gordon, that this association be re-organized, and that every man engaged in the manufacture of cooperage stock in the counties of Essex, Kent and Lambton, be invited to join this association, and that a meeting be held at an early date to enroll members for the same.

REVIEW OF THE SITUATION.

An important part of the proceedings was the able speech made by Mr. S. J. Sutherland, explanatory of the reason of calling together the present meeting. He said:

"I think we have arrived at a period in the history of the cooperage industry when strong and vigorous action should be taken for mutual protection.

You are all aware that for a considerable period of time tariff legislation has been before the United States, the Wilson bill having been sent to the Senate; the Senate changed many items, and a committee of both houses are wrestling with the matter in the way of a compromise before the bill can be passed to the president for his signature. This makes matters very unsettled; capital is timid and manufacturers have been going very slow, buying from hand to mouth until tariff legislation is completed and manufacturers know just what they have to contend with.

Then came the financial crisis which began last May, and which resulted in enormous shrinkage in values, industrial corporations suffering as well as railroad corporations. It was simply a panic that was ruinous to many, resulting in a large number of failures and involv-

ing large amounts. Possibly but for the action of our own company, and one or two others, the situation would have been desperate to many users of cooperage stock. I tell you, gentlemen, that it was often absolutely impossible for them to pay their bills. I don't think since '57, if you take Dunn's and Bradstreet's assignment reports, that you would find so many failures. Now this situation had a very depressing effect.

We thought possibly that matters would improve, and after matters began to settle down, and confidence had been again restored, we had that coal strike, and not long after this the trouble between Geo. M. Pullman's Palace Car Company and his employees, and a sympathetic strike by the American Railway Union.

We are paying in Canada higher wages to our employees than the average wage in Michigan, Ohio and Indiana. This I know personally, and it simply means that if we are going to be able to compete and put our goods on American markets, we have got to make up our minds as manufacturers to accept very much lower prices in Canada, or curtail production. It seems to me that Mr. Morris' and Mr. Gordon's suggestion to curtail expenses would be the easiest way out of the difficulty, as, by shutting down for thirty days, the production in this country would be curtailed to the extent of twenty-four or twenty-five million staves, and the market be placed in a healthier and stronger position; and we should go slow as our largest markets are in the United States. Fifty-five per cent. of the staves manufactured in Canada are shipped to the United States, and, as intelligent business men, we should act in a conservative manner until such time as business matters settle down in the Republic and the output of our factories can go into consumption. Mr. Gordon mentioned that the duty may be taken off staves. Allow me to say to you that I have tried to obtain information on this point, and I very much question that they will be put on the free list, especially jointed staves. Provided mills close down for thirty days, possibly twenty-four to twenty-five million less staves will be produced; but it is not that twenty-five million staves, but our action to-day, if ratified, that will have its effect; manufacturers of cooperage stock in Michigan, Ohio and Indiana, will note that the manufacturers of Canada have deemed it advisable to close for a time, and they will at once start to take some action, and do as we are doing to-day. It will not simply mean a falling off in Canada, but also in Michigan, Ohio and Indiana, and I firmly believe from my heart that we should confer together and adopt some strong course of action, and that every man manufacturing cooperage stock in Canada should be invited to join our association, that we may have an association strong enough to make its influence felt; and that all may work together unitedly as one man, towards putting this industry in better shape and condition. I may say that so far as our company goes, everything that can be done will be done, because I tell you, gentlemen, that there is no money in the business for any body when the markets are overstocked, and it simply means that if united action is not taken, it is going to seriously affect the business of '95. We do not want artificial prices, we only want figures that will enable us to pay fair wages to our men, fair prices for our timber, and a fair percentage on the money invested. I think it is for us to say whether the business can be done at a profit, or whether we are going to put our hands in our pockets and throw out money.

I believe that it is wise for us to manufacture and produce less. There is no question in my mind whatever that every log we have, every tree standing, will be worth much more money. We will be paid fairly good living prices for anything we have to sell, and we will have no trouble in disposing of all the stock we can manufacture.

TO CLOSE DOWN.

The decision of the meeting was quite unanimous in favor of re-organizing the association, which was accordingly done. Mr. Morris was elected president; Mr. Naylor, vice-president, and Mr. Sutherland, secretary-treasurer. It was also resolved that the mills close down for a period of 30 days.

COOPERS' CHIPS.

THE stave, heading and hoop factory of Sutherland, Innes Co., at Romney, Ont., was burned on July 20. It was a new factory and about the largest the Company operated. It will be rebuilt immediately.

THE B. C. Cooperage Company, of Vancouver, B. C., have replaced their shops, recently destroyed by fire, with works erected on a better and more extensive scale than formerly. This firm are manufacturing lime barrels in large quantities for the Honolulu trade.

THE anticipation of a large apple crop gives encouragement to coopers, that serves as some offset to a depression in barrel-making in other ways. "Boss coopers" are already storing, we are told by a western manufacturer of barrels, "to meet anticipated wants."

It is stated locally that if the stave mills are closed down in the Chatham district, it will throw out of employment 1250 men and a month's cessation of work will mean a reduction of cooperage stock of some \$120,000. Should the example of the Canadian mills be followed by the mills in Michigan, Indiana and Ohio, as is apprehended, there will be 23,000 men thrown out of employment. Many of these workmen earn \$3.00 a day. The wage bill of Sutherland, Innes & Co. is about \$6,000 a week. This firm controls the product of 23 mills.

PENALTIES FOR BULLING THE MARKET.

IN ye olden days the "bull" did not have the free hand of to-day. The Mark Lane Express tells the story of the conviction and punishment of a "bull" operator on the market at an early day. It says:—The following advertisement, which appeared in the Annual Register for 1759, shows that in those days anything under 48s. per qr. was considered an unremunerative price for wheat, and that it was not safe to try to "bull" the market. If a similar punishment was meted out to the scores of "bulls" in the "Baltic," and the fines were applied to the benefit of the Royal Agricultural Benevolent Society, that organism would soon be well off for funds, unless the "bulls" saw the error of their ways:—

"Whereas I, Wm. Margetts, the younger, was at the last assizes for the county of Cambridge, convicted upon an indictment to raise the price of corn in Ely market, upon the 24th day of December, 1757, by offering six shillings a bushel for wheat, for which no more than 5s. 9d. were demanded; and, whereas, on the earnest solicitation and request of myself and friends, the prosecutor has been prevailed upon to forbear any further prosecution against me on my submitting to make the following satisfaction:—viz., upon my paying the sum of £50 to the poor of Ely, to be distributed by the minister and churchwardens of the several parishes of the town of Ely; and the further sum of £50 to the poor inhabitants of the town of Cambridge, to be distributed by the minister and churchwardens of the several parishes in the said town; and the full cost of prosecution; and upon my reading this acknowledgment of my offence publicly, and with a loud voice, in the presence of a magistrate, constable, or other peace officer of the said town of Ely, at the market place there, between the hours of twelve and one o'clock on a public market day, and likewise subscribing and publishing the same in three of the evening papers, published in the London and Cambridge Journal on four different days. I have accordingly paid the said two sums of fifty pounds and costs, and do hereby confess myself to have been guilty of the said offence, and testify to my sincere and hearty sorrow for having committed a crime, which in its consequences tended so much to increase the distress of the poor in the late calamitous scarcity. And I do hereby most humbly acknowledge the lenity of the prosecutor, and beg pardon of the public in general and of the town of Ely in particular. This paper was read by me in the public market place at Ely in the presence of Thomas Annejur, gentlemen, chief constable, on the 2nd day of June, 1758, during a public market day there, and is now, as a further truth of just sense I have of the heinousness of my crime, subscribed and published by me William Margetts. Witness—James Day, Under Sheriff of Cambridgeshire."

THE NEWS.

—A. Burland is erecting a new flour and feed mill at Grimsby, Ont.

—G. R. Harper & Co., millers, Dundas, have assigned to C. S. Scott.

—Kinnie & Co., grist millers, Hopewell Hill, N. B. are re-reported insolvent.

—Incorporation has been granted the Virden Milling Co., Virden, Manitoba.

—The farmers in the vicinity of Sewell, Man., are agitating for a grain elevator.

—J. E. & R. S. Lauson, saw and grist millers, Stanley, N.B., assigned recently.

—W. T. Craven, dealer in flour and feed, Winnipeg, Man., has given up business.

—Mr. Drury will erect a flour mill at Port Colborne, Ont., at a cost of about \$13,000.

—Fraser & Co., saw and grist mills, Edmonton, N. W. T., Malcolm McLeod, deceased.

—It is stated that there are still 750,000 bushels of wheat of last year's crop in store west of Winnipeg.

—The Altona, Man., Farmers' Elevator Company is seeking incorporation, with a capital stock of \$5,000.

—John Askew & Son have recently placed a quantity of new machinery in their roller mill at Leamington, Ont.

The roller flouring mills at Bolton, Ont., are being offered for sale by tender, owing to the death of the late proprietor, A. McFall.

—Byran & Co.'s stave and hoop mill near Cedar Springs, Ont., was destroyed by fire the early part of last month. Loss, \$10,000.

—Lequin & Co.'s flour mill at Farnham, Que., recently burned, is being rebuilt. It will cost in the neighborhood of \$10,000.

—The employees of Wm. & J. G. Greey, the well-known mill furnishers, of Toronto, held their annual picnic to Lorne Park on the 4th inst.

—The oatmeal mills at Pilot Mound, Man., were closed down recently for the season. The proprietor, Mr. Dow, is at present on a visit to England.

—The well known firm of Marsan & Brosseau, grain dealers, Montreal, were recently compelled to make an assignment. Their liabilities are placed at \$150,000.

—S. & J. Armstrong, millers, of McKellar, have been compelled to make an assignment. The liabilities will be about \$10,000, and the assets nominally the same.

—James Dow, a resident miller of St. Thomas, Ont., died on the 3rd inst. from the effects of bursting a blood vessel. He was 51 years of age and a native of Scotland.

—The exhibits of grain sent from Manitoba and the North West territories to the San Francisco Midwinter Fair, have been awarded the gold medal, being the finest samples on exhibition.

—The Goldie & McCulloch Co., of Galt, will install the complete outfit in Muir & Ross' new mill at Mattawa, Ont. The mill building is now being erected and will be completed at an early date.

—A fire which had its origin in the engine room of A. E. Sinasec's flour and grist mill destroyed a large portion of the village of Harrow, Ont., on the 4th inst. The loss on the mill is roughly estimated at \$11,000 and the insurance, \$5,800.

S. A. McGaw, President of the Winnipeg Grain Exchange, has recently returned from a three-weeks trip in the western and southwestern districts of Manitoba. He reports that in some sections the crops have been affected by the recent dry weather.

—The Brackmae & Ker Milling Company have purchased the business of the British Columbia Milling & Feed Co., New Westminster, B. C., of which Batchelor & Quine were the promoters. The new proprietors will increase the capacity and continue to operate the mills.

—Incorporation is being sought from the Dominion Parliament by "The Shirra Milling Company" for the purpose of manufacturing flour and feed. The place of business will be Caledonia, Ont., and the capital stock, \$25,000. Robert Shirra, miller, and a number of local farmers are the applicants.

—The business of D. Goldie, proprietor of the Greenfield mill at Ayr and the Cumberland mill at Highgate, Ont, will in future be carried on under the name of "The Goldie Milling Company, Limited," a new company having been formed. Mr. Goldie's associates in the new firm are Messrs. James Goldie, George E. Goldie and Robert Neilson, all of whom have been connected with the business for an extended period. Mr. David Goldie is president, and Mr. Neilson secretary.

—A. M. Hamilton, of Warkworth, has purchased a flour mill at Sarnia, Ont., and will remove to that town. H. A. Mulhern, late proprietor of the Otonabee roller mills, Peterboro, has been engaged as manager.

—The flour mill of W. J. Humphries, at Lang, Ont., which was destroyed by fire, is being rebuilt. Wm. & J. & Greey, of Toronto, will furnish the machinery for the new mill, which will have a daily capacity of 50 barrels. An oatmeal plant may also be put in.

—The by-law granting a bonus of \$6,000 and exemption from taxation for ten years to a proposed new flour mill at Brandon, Man., was defeated recently. A by-law to exempt the mill of Alexander, Kelly & Co. from taxation for ten years was also defeated.

—It is reported that the firm of McAllister & Son, millers, of Pembroke and Pakenham, has been dissolved. Mr. C. B. McAllister will control the mills at Pakenham, while a syndicate composed of Messrs. W. B. McAllister, A. Foster, A. Millar and C. Chapman will operate the mills at Pembroke, part of which were lately destroyed by fire, and which will be fitted up with the latest machinery.

—Campbell's mill at Toronto Junction, which ran 18 hours per day during the first half of the year, is now operating day and night. The output of this mill is sold in the city of Toronto and in Quebec and the lower provinces. The orders now in sight will, it is believed, be sufficient to keep the mill in full operation until the close of the year. The bulk of the flour shipped to the lower provinces is made from soft wheat.

PUBLICATIONS.

We are pleased to welcome to our table early copies of the Milling and Market News, published by Mr. R. W. Dunham, formerly of the London, Eng., Miller. The new journal is tastily printed and covers in an able manner the milling and grain fields.

GRAIN AND FLOUR TRADE OF MONTREAL.

IN a recent review of the trade of Montreal the Mail has gathered some interesting figures touching Montreal's position in the grain and flour markets of the Dominion. The exports of grain and products the result of manufacture from it last year, totalled up, we are told, to the sum of \$16,200,000. Montreal grain brokers and flour men handled a large part of this business.

Early pioneers in the handling of the grain trade of Montreal were: George Denham, C. J. Cusack & Co., the Hon. John Young, John M. Young, the Hon. Louis Renaud, and Rimuer, Gunn & Co. They have all gone out of existence now, but their places have been well filled since. In 1846 the exports via the St. Lawrence route were about half a million barrels and as many bushels of wheat and flour, all of which went to Great Britain. Three years later the exports of breadstuffs had increased to three million bushels, the exports of the previous year having been only 968,605 bushels. From that period the shipping of wheat via Montreal to Europe increased steadily. In the year 1852 Mr. Ira Gould leased the first water power conceded in the then new canal for a manufactory of any kind. This was the birth of the long street of mills and factories now known as Mill street, with their output of many millions of dollars annually. It was in the same year that the Hon. A. W. Ogilvie joined his father's firm, then the leading milling firm of the province. Their mills were at the foot of the Lachine Rapids and out in Jacques Cartier county, but when Mr. Gould built his mill on the canal, the Ogilvies were not slow to recognize the advantage of a site on the same artery, and the erection of Mr. Gould's City Mills was immediately followed by that of the Glenora Mills at Seigneur street, and the Ogilvies commenced making flour on a large scale. They brought down wheat from different points in Ontario with the aid of schooners, and when the supply at the points first tapped was exhausted, a move was made further west, and grain was imported from Chicago and Milwaukee. The year 1856 witnessed the construction of the Grand Trunk railway.

Thirty-five years ago the flour market of Montreal was probably the largest on the whole continent, with the exception of that of New York. The whole eastern country, the Lower Provinces, Gaspe, Prince Edward Island, and the Halifax and St. John districts were tributary to Montreal. Merchants came thence to the metropolis to make their purchases, and the volume of business done was large. It is these days that the Montreal middlemen point to now as the golden days of the

flour trade. As the years advanced, however, and communication became more perfect, that universal tendency to do business as direct as possible between producer and consumer became more and more apparent, and Montreal lost its prominence as a distributing point for flour. The opening of the Intercolonial railway was the inception of this change, for with the system of granting through rates from milling points, and the natural inclination of the buyer to save the middleman's profits, if possible, sent the bulk of the business past Montreal. To-day eastern buyers almost exclusively deal with the millers either in Montreal or Ontario direct, and the flour business in Montreal is more or less of a local one.

The construction of the C.P.R. and the opening of the great plains of the West was the next epoch in the history of Montreal's milling trade. As early as 1875 Mr. W. W. Ogilvie had visited Manitoba and the North West, and made a searching enquiry into their possibilities as centres of grain production. He was the first, therefore, to use Manitoba wheat, and to-day No. 1 hard Manitoba wheat, like No. 1 hard Duluth, makes the best flour in the world to-day, and the system of milling in Canada is not surpassed by any in the world. The enormous business of the Ogilvie Milling Company is a visible demonstration of this fact, the output of the various mills under Mr. Ogilvie's control being the greatest controlled by any one individual man on this continent.

To grain exporters the St. Lawrence route via Montreal offers advantages possessed by absolutely no other route in America, and everything else being equal, should have the preference over all others. Its advantages in the matter of coolness, etc., have been dwelt upon so often before that it is needless to repeat them. In fact this is the natural outlet of the West, and the opinion has been expressed time and again that with inland and ocean freights properly adjusted Montreal could, in summer at least, secure a much larger portion of the export trade than she actually does. The question of freight rates is naturally a vexed one, and one upon which it is hardly likely that shippers and carriers will ever agree. It is interesting, in view of this difference of opinion, to contrast the comparatively moderate forwarding rates of to-day with those of twenty or thirty years ago. The old rate of 6½c. per bushel on grain from Kingston to Montreal has been reduced to 2½c., and 6½c. is the present rate from Duluth to Port Arthur.

The tables which are appended have been gathered from the official returns of the Board of Trade, and show the record of the export of grain, etc., from the port of Montreal in 1890 and in 1893. This will give a pretty good idea of the business that has been going on during the past four years. During 1890 the grain dealers of Montreal handled and exported 2,623,050 bushels and barrels of Canadian grains and flours. This was valued at \$2,917,076. In the same year the exports of American grain via Montreal was greater than those of the produce of Canada, being 8,980,223 bushels and barrels, of a value of \$5,122,300. In 1893, however, the position was reversed. Montreal's exports of Canadian produce proper last year were eight millions of dollars greater than those of 1890, and the quantity had increased by over twelve million bushels. The exports of American produce via this port last year were 6,827,794 bushels, of a value of \$4,857,345.

The detailed figures of the exports of Canadian grain proper are as follows for the two years under consideration:—

Article.	1890.		1893.	
	Quantity.	Value.	Quantity.	Value.
Barley, bushels.....	54,923	\$ 28,095	354,711	\$ 198,470
Beans, ".....	2,533	3,085	4,068	7,097
Oats, ".....	203,590	61,210	5,484,147	1,917,630
Peas, ".....	1,482,005	987,011	2,346,656	1,701,317
" split, ".....	125,902	76,083	541	784
Rye, ".....	179,894	98,274	41,972	30,097
Wheat, ".....	371,480	355,747	4,881,310	4,172,075
Other grain ".....	11,202	5,603	24,103	15,055
Flour, barrels.....	36,958	183,160	274,334	1,223,489
Oatmeal, ".....	35,846	145,361	84,541	359,445
Other meals ".....	22,112	70,313	3,131	7,972
Hay, tons,.....	95,599	902,440	112,408	1,083,806
Totals.....	2,623,050	\$2,917,076	13,612,822	\$10,717,247

ONTARIO WHEAT.

OPINIONS OF NEARLY 100 REPRESENTATIVE MILLERS.

ABOUT a fortnight ago communications were sent out to the members of the Dominion Millers' Association in Ontario with the purpose of ascertaining their views regarding the winter wheat crop now being harvested, the prospects of the spring wheat crop, and the area sown with winter and spring wheat. Replies were received from 95 of the leading millers of the province, representing widely different districts.

Interest naturally centres in the question at this time, what will be the yield of wheat? and it has been specially to this question that the answers of correspondents has been directed. The average yield of winter wheat is estimated at 22 25-39 as against 19 last year, and of spring wheat 16 3/4 as against 12 3/4 last year. Out of the 95 districts covered by replies, wheat was sown in 78 of them and spring wheat in 43 of them. A digest of the various reports would indicate in the matter of fall wheat, that whilst the acreage sown is smaller than a year ago, the increase in yield will about cover up the shortage in acreage, bringing the total yield for the province up to about the same as a year ago. The general run of the replies estimate the yield of winter wheat from 20 to 25 bushels per acre, though in some localities the yield is expected to be more abundant. Grey will probably give a yield of 30 bushels per acre. In Simcoe the figures are fixed in, at least, one point at 35 bushels per acre. In the Hespeler district of Waterloo county the yield will run from 25 to 30 bushels per acre. Haldimand expects an increase of probably 5% in the yield over a year ago.

The decrease in the acreage sown in spring wheat is more remarkable than in the case of fall wheat, and at the same time an increase in yield will, in individual localities at any rate, help materially to level up the decrease in acreage.

Each individual report will bear a careful study by millers, as suggesting problems that are commencing to show themselves in connection with the question of wheat raising, and that sooner or later will have its bearing on milling.

MILLERS' VIEWS.

A synopsis of the views of millers is as follows:

W. B. Brown & Co., of Simcoe, state that the winter wheat yield per acre in the county of Norfolk will be 25 bushels, as against 20 bushels last year. No spring wheat is grown in this locality; acreage is about the same as last year. The sample will be somewhat uneven.

In the county of Leeds the yield of winter wheat will be about 14 bushels to the acre, according to the estimate of Mr. R. Harvey. The yield last year was rather less. Spring wheat will yield about 15 bushels to the acre. The acreage of winter wheat is reduced about one-sixth, and acreage of spring wheat about the same.

Telfer Bros. estimate the yield of winter wheat at 30 bushels to the acre, and spring wheat about 15 bushels to the acre. The acreage of both spring and winter wheat has been reduced about 50 per cent.

Brown Bros. state that the acreage of both spring and winter wheat in the county of Welland will be about the same as last year. Very little wheat is grown in this county. The yield will be about 10 per cent. less than last year.

In the county of Grey the yield of winter wheat will be about 30 bushels to the acre, against 20 last year, according to the estimate of Mr. John W. Ford. Four townships in this county grow very little wheat. The yield of spring wheat will probably be 20 bushels, as against 15 last year. The acreage of winter wheat has been reduced 50 per cent., and that of spring wheat about 50 per cent.

In north-east Kent winter wheat yield, as estimated by Tyler & Mayhew, of Thamesville, Ont., will be 17 bushels, as against 22 last year. No spring wheat. Acreage of winter wheat slightly reduced. Some early wheat on light land destroyed by frost in June; late wheat on clay rusted. Really good wheat fields are the exception.

Messrs. J. M. Lott & Co., of Lambton, estimate the yield in that county at 18 bushels to the acre, as against 20 last year, and spring wheat 10, as against 12 last

year. Acreage reduced about one-third, spring wheat about the same as last year. Oats at present appearance will be a good crop.

Messrs. Wm. Snider & Co. state that in the county of Waterloo winter wheat will yield 25 bushels to the acre, as against 18 last year. Acreage reduced 10 to 15 per cent. Very little spring wheat raised here, not worth mentioning.

William Pearson estimates the yield of winter wheat in the county of Simcoe at 30 bushels per acre, as against 20 last year; spring wheat 20, as against 10 last year. Winter wheat acreage decreased one-half; spring wheat acreage the same as last year.

M. J. Beech, Dundas, states that the yield of winter wheat in that county will be about 25 bushels per acre, as against 10 last year. Spring wheat 25, as against 10 last year. Crops in this locality appear better all round than those of last year.

Messrs. McIntyre & McDonald estimate the yield of winter wheat in the county of Grenville at 20 bushels per acre, as against 15 last year; spring wheat 22, as against 12 last year. Acreage of winter wheat has been reduced 75 per cent., and spring wheat 20 per cent. Oat crop very poor.

C. & G. J. Wilram, Masson, Que., estimate the yield of spring wheat in the county of Ottawa at 6 bushels, as against 10 last year; winter wheat none. Acreage of spring wheat reduced 10 per cent. Oats and peas will probably be a failure; too wet.

Merrickville Milling Company estimate the yield of winter wheat in the county of Grenville at 10 bushels per acre, as against 15 bushels last year. Spring wheat 20, against 15 last year. Only about 10 per cent. of the wheat required for local consumption is grown in this district.

E. J. Presant, Guelph, estimates the yield of winter wheat in the county of Wellington, per acre, at 25 bush., against 18 last year. Hardly any spring wheat sown. Acreage of winter wheat has been reduced 10 per cent. Spring crops promise light yield for want of rain.

J. C. Vanstone, of Bowmanville, estimates the yield of winter wheat in West Durham at 20 bushels to the acre, as against 20 last year. Spring wheat 20, as against 13 last year. Winter wheat acreage about the same; spring wheat acreage reduced fully 50 per cent. Many farms have no wheat. Too early to say much about spring wheat; it looked well this time last year, but failed later.

M. M. Stephens & Son estimate the yield of winter wheat in the county of Simcoe at 25 bushels per acre, as against 15 bushels last year. No spring wheat in this section. In the nearest spring wheat to them acreage has decreased considerably.

Geo. Bell, Erin, estimates the yield of winter wheat in that section of Wellington at 28 bushels per acre, as against 22 bushels last year. Spring wheat, 14 bushels, as against 12 bushels last year. The winter wheat acreage is about the same; spring wheat decreased about 50 per cent.

R. P. Hoover estimates the yield of winter wheat in the townships of Pickering and Markham at about an average, as against an average last year. Spring wheat, scarcely any sown.

J. & R. Bell estimate the yield of winter wheat in the county of Simcoe at 25 bushels per acre, as against 25 last year. Spring wheat 20, as against 15 last year. Acreage about the same. Winter wheat is badly down and will not fill out well.

Geo. H. Harper estimates the yield of winter wheat in the county of Wentworth at 20 bushels per acre, as against 18 last year. Acreage of winter wheat has been reduced 3 per cent.; spring wheat, none grown. The sample of winter wheat will be good if the present weather holds.

G. S. Baldwin estimates the yield of winter wheat in the county of York at 18 bushels per acre, as against 18 last year; spring wheat 16 bushels, as against 12 bush. last year. Acreage of winter wheat has been reduced probably 10 per cent., and of spring wheat about 25 per cent. Spring wheat here is principally goose.

G. Copeland & Son estimate the yield of winter wheat in the county of Simcoe at 25 bushels per acre, as against 15 bushels last year; spring wheat 15 bushels, as against 10 last year; acreage of spring and winter wheat has

been reduced about 33 1/3 per cent. Messrs. Copeland state that these observations apply to the part of the county in which they are located.

George Needler estimates the yield of winter wheat in the county of Durham at about the same as last year. Spring wheat, 10 bushels per acre, as against rather less last year. Acreage of winter wheat slightly increased, and of spring wheat probably reduced.

G. Carter, Son & Co. estimate the yield of winter wheat, county of Perth, at 20 bushels per acre, as against 20 last year. Spring wheat, nil; scarcely any sown and a poor yield, same as last year. Acreage of winter wheat reduced 10 per cent.

John McLaren estimates the yield of spring wheat in the county of Renfrew at 20 to 24 bushels per acre, as against 7 or 8 last year; winter wheat, none grown. The acreage of spring wheat has been reduced 10 per cent.; peas will be under the average; oats, fair.

H. Brown & Sons, Carleton Place, write as follows: "There is very little fall wheat grown in this section. The spring wheat acreage has been considerably reduced, but we are not in a position to give any figures. The wheat looks well now, but we think it will go back before harvest."

J. & P. R. Howard estimate the yield of winter wheat in the county of Haldimand at 30 bushels per acre, as against 25 bushels last year; spring wheat, hardly any sown, very little sown last year; acreage of winter wheat has increased about 5 per cent. The farmers are all busy cutting wheat; it will be a fine sample.

Amoyer & Co. estimate the yield of winter wheat in the county of Perth at 20 bushels an acre, as against 23 bushels last year; spring wheat 10, as against 10 last year; acreage of winter wheat decreased about 30 per cent., and spring wheat 50 per cent.; crops around Listowel look pretty fair, but west, towards Brussels, are rather short and unhealthy looking.

J. Lee & Sons estimate the yield of winter wheat in the county of Bruce at 20 bushels per acre, against 15 last year; spring wheat, good, as against 10 last year. Not much spring wheat sown, but what there is looks well; acreage of winter wheat reduced about 30 per cent., and spring wheat, slightly increased.

J. & R. W. Hazlewood, Clifford, Ont., estimate the yield in that part of Wellington at from 20 to 30 bushels per acre, as against same last year; spring wheat, none grown; acreage of winter wheat, decreased 50 per cent.

E. W. B. Snider estimates the yield of winter wheat in the township of Woolwich, Waterloo, at 25 bushels per acre, as against 25 last year; spring wheat, none sown. Mr. Snider adds that he gives the yield of fall wheat as claimed by farmers, but he considers the estimate rather high.

Lewis Kribs, Hespeler, estimates the yield of winter wheat in the county of Waterloo at 25 bushels per acre, as against 20 last year; spring wheat, none; acreage of winter wheat, about the same as last year. Mr. Kribs states that except on the lowlands the wheat is good and high, and will average 30 bushels to the acre.

William Sutton, Simcoe, estimates the yield of winter wheat in the county of Norfolk at 25 bushels, as against 20 last year; spring wheat, none; acreage of winter wheat about the same as last year. New wheat is now being delivered, and samples good.

Messrs. T. & J. N. Andrews, Thornbury, Ont., estimate the yield of winter wheat in the county of Grey at 25 bushels per acre, as against 18 bushels last year; spring wheat, 15 bushels, as against 7 last year; acreage of winter wheat, about the same as last year; spring wheat, 50 per cent. less.

W. Wenger & Bros., Ayton, Ont., state that in the south-west part of Grey the yield of winter wheat will be rather better than last year. In this locality there is no spring wheat grown. The acreage of winter wheat has decreased fully 10 per cent.

T. O. Kemp estimates the yield of winter wheat in the vicinity of Seaforth at 20 bushels to the acre; spring wheat, acreage so small it cannot figure to any effect. There was very little last year, and less this.

William Campbell, secretary of the Nottawasaga Farmers' Milling Company, Limited, Duntroon, Ont., estimates the yield of winter wheat in the county of Simcoe at 25 bushels per acre, as against 10 bushels

last year; spring wheat 15 bushels, against 5 bushels last year; acreage of winter wheat has been reduced 25 per cent., and spring wheat 50 per cent.

J. W. Carveth, Leskard, Ont., roughly estimates the yield of winter wheat in that part of the county of Durham at 20 bushels to the acre, as against 15 bushels last year; spring wheat 15, as against 5 last year. Mr. Carveth states that not over quarter of spring wheat sown last year is sown this year. The weevil, he states, is starting its work, and the yield may be nothing.

George Heimbecker estimates the yield of winter wheat in Bentinck township, county of Grey, at 25 to 30 bushels per acre, as against 15 to 20 last year; spring wheat, not much grown there; acreage of winter wheat has been reduced 10 per cent.

R. J. Walsh estimates the yield of spring wheat at 20 bushels per acre, as against 10 bushels per acre last year; winter wheat, none grown; acreage of spring wheat has been reduced 50 per cent.

Thomas Elliott estimates the yield of winter wheat in West Durham at 25 bushels per acre; spring wheat, 12 bushels; acreage of winter wheat is about the same as last year; spring wheat reduced some.

William McElwain estimates the yield of winter wheat in the county of Simcoe at 20 bushels per acre, as against 15 last year; spring wheat at 15, as against 10 last year; acreage of winter wheat has been reduced about 20 per cent., and of spring wheat 50 per cent.

E. & N. Moody, Orangeville, Ont., estimate the yield of winter wheat in county of Dufferin at 20 bushels per acre, as against 15 last year; spring wheat 15, as against 15 last year. Acreage of winter wheat is about the same as last year, and of spring wheat about two-thirds less; peas, full crop; barley, one-third less; hay, half crop; oats, full crop.

R. Reyburn estimates the yield of winter wheat in the county of Hastings at 22 bushels per acre, and of spring at 10 bushels per acre. Acreage of winter wheat reduced 10 per cent., and of spring 20 per cent.

James Cumming estimates the yield of wheat in the county of Leeds at 20 bushels per acre, as against 15 bushels last year, and of spring wheat 15 bushels, as against 15 last year. Acreage of winter wheat has been reduced 25 per cent., and of spring wheat 50 per cent.

Whitlaw, Baird & Co., Paris, Ont., estimate the yield of winter wheat in the county of Brant at 25 bushels per acre, as against 15 last year. Acreage of winter wheat has increased 10 per cent.

W. Y. Emery estimates the yield of winter wheat in the county of Norfolk at 15 bushels per acre, as against 20 bushels last year; spring wheat, none grown.

Alex. McLaren estimates the yield of spring wheat in the county of Renfrew at 20 bushels per acre, as against 10 last year. Acreage of spring wheat has been reduced about 33½ per cent. Oats, poor, not half a crop; peas, good, but damaged by the wet.

S. R. Stuart, Mitchell, estimates the yield of winter wheat in the county of Perth at 25 bushels, as against 25 bushels per acre last year; acreage of winter wheat has been reduced about 10 per cent. The prospects here are for a good average crop of good quality.

William Brodie, Bridge End, Ont., estimates the yield of winter wheat in the east half of the county of Gengarry at 20 bushels per acre, as against 15 bushels last year, and of spring 10 bushels, as against 7 last year; acreage of winter wheat, small; spring wheat, about 25 per cent. less than last year.

Tavistock Milling Company estimate the yield in the county of Oxford of winter wheat at 28 bushels per acre, as against 25 bushels last year; spring wheat, 18 bush., against 20 bushels last year; acreage of winter wheat reduced 10 to 15 per cent., and of spring wheat 20 per cent.

Gibson & Co., Morrisburg, estimate the yield in the county of Dundas of winter wheat at 20 bushels per acre, as against 27 last year; spring wheat, 12 bushels, as against 10 last year; acreage of spring wheat has been reduced about 20 per cent.

W. S. Ireland estimates the yield of winter wheat in the county of Simcoe at 35 bushels per acre, as against 20 bushels last year, and of spring wheat 25 bushels, as against 15 last year; acreage of winter wheat has been reduced about 10 per cent., and of spring wheat about the same as last year.

Messrs. Lake & Bailey estimate the yield of winter wheat in the county of Wentworth at 25 bushels per acre, as against 20 last year; spring wheat, none sown.

Fred Rollins, Madoc, Ont., estimates the yield of winter wheat in the county of Hastings at 20 bushels, as against 15 bushels last year; spring wheat at 25 bushels, as against 14 last year; acreage of winter wheat is about the same as last, and of spring wheat about 10 per cent. increase; barley and peas are above the average; oats, half crop; rye, good.

James Goldie, Guelph, estimates the yield of winter wheat in the county of Wellington at 25 to 30 bushels per acre, as against about 20 last year; spring wheat, not much sown.

H. Barrett, Port Hope, Ont., estimates the yield of winter wheat in the county of Durham at 20 bushels per acre, as against 20 last year; spring wheat 10 bushels, as against ten last year; acreage of winter wheat is about the same as last year, and of spring wheat reduced 75 per cent.

Alexander Dobson, Beaverton, estimates the yield of winter wheat in North Ontario at 20 bushels per acre, as against 20 last year; spring wheat 15, as against 15 last year; acreage of winter wheat has increased about 10 per cent., and of spring wheat reduced about 25 per cent.

G. E. Smith, Hagersville, Ont., estimates the yield of winter wheat in the county of Haldimand at 18 to 20 bushels per acre, as against 16 to 18 last year; acreage of winter wheat has been reduced about 5 per cent., spring wheat, very little sown here.

William B. Wood, St. George, Ont., estimates the yield of winter wheat in the county of Brant at 20 bushels per acre, as against 18 bushels last year; acreage of winter wheat about the same; spring wheat, very little grown in this locality.

Angus Plewes, Markdale, estimates the yield of winter wheat in the county of Grey at 30 bushels per acre, as against 25 last year; spring wheat 20, as against 15 last year; acreage of spring and winter wheat has been reduced about 50 per cent. Not much wheat sown here on account of low prices.

John Campbell estimates the yield in the county of Elgin at 18 bushels per acre, as against 18 bushels last year; spring wheat, none; acreage of winter wheat about the same as last year.

Charles Smith, Campbellford, writes as follows: "If fall wheat had not been winter killed we would have had a big crop. Coarse grain is good, except oats, which is going to be a short crop." Mr. Smith estimates the yield of winter wheat in Northumberland at 15 to 20 bushels per acre, as against 20 bushels last year; spring wheat, 12 bushels, as against 10 bushels last year; acreage of spring and winter wheat decreased about one-third.

N. H. Stevens, Chatham, Ont., estimates the yield of winter wheat in the county of Kent at 25 bushels per acre, as against 20 bushels per acre last year; winter wheat decreased about 10 per cent.

R. M. Easton estimates the yield of winter wheat in the county of Grenville at about 15 bushels per acre, as against 15 last year, and of spring wheat 25 bushels, as against 12 bushels last year. Acreage of winter wheat is about the same as last year, and of spring wheat increased 33½ per cent.

R. A. Thompson estimates the yield of winter wheat in the county of Wentworth at 22 bushels per acre, as against 20 bushels last year; spring wheat none. Mr. Thompson adds: "In this section fall wheat appears to be coming in good, promising good quality and yield."

N. Boswell, Wyoming, Ont., estimates the yield of winter wheat in the county of Lambton at 29 bushels per acre, as against 20 bushels last year, and of spring wheat 21 bushels, as against 17 bushels last year. Acreage of fall wheat about the same as last year, and of spring wheat about one-quarter less.

Pearen Bros. estimate the yield of winter wheat in the county of Peel at 20 bushels per acre, as against 20 bushels last year; spring wheat, 10 bushels, as against 10 bushels last year. Acreage of winter wheat has increased about 25 per cent. Messrs. Pearen say that all of the spring wheat grown around Brampton is goose, but there was not over half sown this year that there was last year.

R. Neilson, secretary-treasurer of the Goldie Milling Company, Ayr, Ont., estimates the yield of winter wheat in the county of Waterloo at 25 bushels per acre, as against 20 bushels last year; spring wheat none. Acreage of winter wheat is about the same as last year. Mr. Neilson says that harvesting is now in progress, and that the sample will be good.

John Shaw estimates the yield of winter wheat in the county of Norfolk at 25 bushels per acre; spring wheat none. Mr. Shaw adds: "Some of the fields of wheat are badly rusted."

Martin Bros., Mount Forest, Ont., estimate the yield of winter wheat in the south part of North Wellington at 25 bushels per acre, as against 25 bushels last year; spring wheat 20 bushels, as against 15 last year. Acreage of winter wheat has been reduced 25 per cent., and of spring wheat 75 per cent. Messrs. Martin state that there is almost no spring wheat sown in their section, and add that some complaints of rust are heard regarding winter wheat.

Munroe & Snider, Berlin, estimate the yield of winter wheat in the county of Waterloo at 30 bushels per acre; acreage of winter wheat about the same as last year; spring wheat, very little sown.

James Naylor estimates the yield of winter wheat in the county of Essex at 20 bushels per acre, as against 25 bushels last year; spring wheat none.

John Cada estimates the yield of winter wheat in the county of Essex at 15 to 18 bushels, as against 25 last year; spring wheat, none grown; acreage of winter wheat will be reduced 40 per cent.; samples of winter wheat, good.

George Elphicke, Pinkerton, estimates the yield of winter wheat in the county of Bruce at 25 bushels per acre, as against 20 bushels last year; spring wheat, 15 bushels as against 10 bushels last year; acreage of spring wheat will be reduced about 50 per cent.

J. D. Saunby, London, estimates the yield of winter wheat in the county of Middlesex at 25 bushels per acre, as against 20 to 25 last year; acreage of winter wheat will be reduced about one-half; spring wheat, none grown.

Neil McCahill, Forest, estimates the yield of winter wheat in the county of Lambton at 15 bushels per acre, as against 20 bushels last year; spring wheat, 18 bushels, as against 12 last year; acreage of winter wheat has been reduced 10 per cent.

J. W. Wylie, Almonte, estimates the yield of winter wheat in the county of Lanark at about the same as last year. Spring wheat, 20 bushels per acre, as against 15 last year. Acreage of winter and spring wheat about the same as last year.

Bennett & Constable, Spencerville, estimate the yield of spring wheat in that locality at 25 bushels per acre, as against 25 bushels last year.

W. H. Finnemore estimates the yield of winter wheat in the county of Halton at 21 bushels per acre, as against 18 last year. Spring wheat, none; fall wheat will be a good sample. Barley and oats, light in some sections.

Quance Bros., Delhi, Ont., estimate the yield of winter wheat in the county of Norfolk at 25 bushels per acre, as against 18 bushels last year. Spring wheat, none grown. Messrs. Quance add: "We think fall wheat a much better crop in this county than that of last year. We think the acreage is rather more than last year. Unless price improves fully half the crop will be fed in the event of pork and live stock remaining at present prices."

Wolverton Milling Company, Wolverton, Ont., estimate the yield of winter wheat in the county of Oxford at 22 bushels per acre, as against 20 last year; spring wheat, none; acreage of winter wheat about the same as last year; sample of winter wheat likely to be very fine.

R. B. Clement estimates the yield of winter wheat in the county of Bruce at 25 bushels per acre, as against 20 last year; spring wheat, 20 bushels, as against 15 last year; acreage of spring wheat reduced about 25 per cent. All crops and fruit are good, and will be heavy, except peas.

W. Plewes, London, Ont., estimates the yield of winter wheat in the county of Middlesex at 18.60, as against the same last year; spring wheat, none; acreage of winter wheat will be reduced about one-third, mostly in white wheat. Mr. Plewes adds that oats are going to

be a great crop, and that the acreage has been doubled; the yield this year will probably be four times that of last year.

Shirk & Snider, Bridgeport, estimate the yield of winter wheat in the county of Waterloo at 25 bushels per acre, as against 20 last year; spring wheat, none; acreage of winter wheat about the same. The prospects are for a good sample of new wheat.

Samuel Lukes, Bradford, estimates the yield of winter wheat in that part of the county of Simcoe at 30 bushels per acre, as against 30 bushels last year; spring wheat, 18 bushels, as against 16 bushels last year. Mr. Luke says that there is every prospect of full average crops in all grains, hay, roots and fruit.

Messrs. Macdonald & Robb, Valleyfield, Que., state that owing to the low price of flour very little wheat was sown in that section this year.

The Plattsville Milling Company, Plattsville, Ont., state that winter wheat will be an average in Oxford, as against an average last year; sample of fall wheat will be good.

Ogilvie & Hutchison, Goderich, Ont., estimate the yield of winter wheat in the county of Huron at 20 bushels per acre, as against 16 last year; spring wheat, hardly any sown; acreage of winter wheat is about the same as last year, and sample will be good.

Thomas Eyre, North Agusta, Ont., estimates the yield of winter wheat in county of Grenville at 25 bushels per acre, as against 10 bushels last year, and spring wheat 20 bushels, as against 8 bushels last year; acreage of spring and winter wheat are about the same as last year.

A. M. Fall, Bolton, estimates the yield of winter wheat in the county of Peel at 18 bushels per acre, as against 16 bushels last year; spring wheat, 12 bushels, as against 10 bushels last year; acreage of winter wheat will be reduced 20 per cent. and of spring about one-half.

George Smith, Port Elgin, Ont., estimates the yield of winter wheat in the county of Bruce at 20 bushels per acre, as against 20 bushels per acre last year; spring wheat, 15 bushels per acre, as against 15 last year; acreage of winter wheat will be reduced about one-quarter; spring wheat about the same as last year.

W. H. Meldrum, Peterboro', estimates the yield of winter wheat in that locality as above that of last year; spring wheat, about double the yield of last year; acreage of spring wheat reduced about 75 per cent.

Stewart Graham, Brussels, estimates the yield of winter wheat in the county of Huron at 25 bushels per acre, as against 20 bushels per acre last year; spring wheat, 20 bushels per acre, as against 18 bushels last year; acreage of winter wheat will be reduced about 50 per cent.; spring wheat, very little grown here. Mr. Graham states that fall wheat is being harvested, and that farmers report fine appearance of straw and good plump grain. Other grains, good prospects.

DRIVING ROLLS.

ONE of the evils connected with roller mills, says R. James Abernathy, in the "Tradesman", is the short driving cross belt found on all single belt mills and the larger but almost as pernicious cross belt found on one side of most of the double belt drive mills.

Of the two kinds it may be that the single drive mill is the least obnoxious as most of them use two belts on the opposite side which greatly relieves the situation and makes it much easier on the belts. As has been heretofore stated in these papers, cross belts are very objectionable as a rule, so also are all forms of tighteners. The evils of both have been fully dwelt upon and set forth and users of belting advised to avoid both when possible to do so.

In the case of rolls it would seem that the greater the necessity the greater the evil. There seems so far no possible way of avoiding the use of tighteners on roll belts and nowhere do they seem to do more harm in their deadly effects upon the belt and in increasing the friction on the journals of the rolls. The drive belt on a stand of rolls has no slack side; both folds are always taut. With both folds as tight as drum heads, no belt can do its work without greatly increasing journal friction and thereby increasing the draft upon the power to run it. It would greatly lengthen the life of the belts and

diminish the power for driving rolls if the use of the tightener could be avoided, but so far as discovered it cannot be. But while tighteners may have to be used there is no occasion for the double evil of both cross belts and tighteners as the former can be dispensed with in all drive mills especially.

To proceed with the case the main drive will have to remain substantially as found on all machines, but for the other side, instead of having the customary cross belt, we will provide two independent acting and adjustable idler pulleys that will serve the purpose of keeping the belt tight.

To make these work to the best advantage a frame of two parts and one cross piece or bridge tree, should be provided. The posts, which may be of 6x6 to 9x9 timber, according to size of rolls, must run from basement floor to joists above and be securely fastened both at top and bottom. These posts stand on each side of the driving shaft and right opposite the driving pulley so that a line stretched from center to center of the posts would strike the center of the face of the pulley. The posts should be about one foot away from the driving pulley. That distance can, however, be best determined by the nature of the idler pulleys, as they are made in various forms, but all should be of a swinging nature and not rigid. A rigid device might do, but it is thought that swinging frames are better adapted to the purpose. Under the pulley and a few inches above the floor of the basement, the cross timber or bridge tree must be framed into the posts and the three fastened together either with pins or joist of bolts.

Our old-fashioned millwrights always make a lug tennon on the bridgetree and use wooden pins for drawing the shoulders of cross tie and posts together. But by later methods a short tennon is made and iron joint bolts used for drawing them together. The latter plan is the simplest and best.

To this bridgetree on each side of the drive pulley the idler pulley frames must be secured, and when that is done all is ready for the belt to go on. In putting on the belt we will start, say below the driving pulley, where both ends of the belt will meet below the main driving pulley, when they can be fastened together and the job is finished. Then the belt can be moved around and the swing or riveting done whenever it is most convenient.

ROPE DRIVING.

THE subject of rope driving may properly be placed under two heads, according to the nature of the material composing the ropes—whether fibrous or metallic. With few exceptions metallic or wire ropes are used almost exclusively on long-distance or telodynamic transmission, while fibrous ropes are employed for intermediate and comparatively short drives. Among the materials used in this method of power transmission we find manilla rope in much favor in this country, as well as in Great Britain and Germany.

In many cases ropes of cotton are also used, as they are generally softer and more pliable than the ordinary manilla ropes, thus allowing smaller pulleys to be used with less injury to the fibres. In fact, cotton ropes of small diameter have been used for years in cotton machinery bandings over pulleys and under conditions which would wear out a manilla rope in one-third the time. There is also an advantage, in that there is less internal chafing and wear when the rope is bent over a pulley, on account of the smoothness of the fibres and the great elasticity of the yarns.

The fibre of cotton is in itself a single cell, or hair, which grows on the coat of the seed and is thus a unit. These fibres are divided into two classes, constituting what are known as the short and long stapled varieties, in which the length varies from 3/8 inch to 1 1/4 inches. The unit cell, when attached to the seed in the plant, is in the form of an elongated cylinder, but when dried and separated from the plant the walls of the cells collapse; the flattening of the cells is not uniform nor continuous in a straight line, and as a result the fibre assumes the appearance of a twisted ribbon of numerous convolutions, somewhat resembling a corkscrew.

The shape of the fibre is thus well adapted to the work of being twisted into yarns and on account of each fibre

being a unit its surface is comparatively smooth; the structure of the fibre permits considerable elongation, and especially in the long stapled varieties, the natural wax on its outer surface acts as a lubricant and permits a freedom of motion between the unit fibres without undue wear.

Thus it will be seen that cotton ropes are particularly well adapted to the transmission of power, in which the rope is constantly undergoing a varying strain, and is subjected to much flexion. The strength of cotton ropes is, however, extremely small, and although the weight is about one-third less than manilla the actual first cost is from fifty to seventy-five per cent. greater than for the latter. The working strength of cotton transmission rope may be taken higher, in proportion to its ultimate strength, than is used for manilla, for the latter is weakened by the grease with which it is lubricated, and, moreover, a large factor must be allowed for wear on account of the character of the manilla fibre, which breaks more easily under bending strains.

As compared with manilla, then, the advantages of cotton ropes of the same diameter are: Greater flexibility, greater elasticity, less internal wear and loss of power due to bending the fibres, and the use of smaller pulleys for a given diameter of rope. Its disadvantages are greater first cost, lesser strength, and possibly, a greater loss of power due to pulling the ungreated rope out of the groove—in any case this is very small with speeds over 2,000 feet per minute.

In England manilla is now being used very largely, but cotton were formally preferred to the exclusion of all others for all kinds of driving, but the most probable cause of this was not that cotton was the best or most economical for the purpose, but that rope driving is most common at cotton factories, and cotton ropes were made in the locality by men who were familiar with the local product and had for years been making spindle and rim bands of small size. When the demand for large sizes arose these rope makers applied themselves to the newer industry and shut out other materials.

In the mills of Dundee and vicinity, and in the North of Ireland, where flax and hemp are worked, we find ropes of hemp, a local product, used entirely.

Rawhide ropes, which are made from 3-8 inch to 2 inches in diameter, are used to a limited extent. Where the stress in a rope is not great and the accompanying slip is small, rawhide works very well, and will last from three to six, and, in some cases, ten years. Under ordinary circumstances, it is not necessary to use any dressing, as sufficient lubrication is furnished by the rope itself; if the rope slips in its groove the leather will be burned and lose its flexibility and also its adhesive qualities to a certain extent. A rawhide rope has very little tendency to rotate on its axis, and for this reason the wear is not uniform, and with a heavy tension it is liable to take the set of the groove in which it runs; this is rather an advantage for a straight drive, where the rope always runs in the same direction, but in those cases where a rope is led on to the pulleys at an angle this will be a disadvantage, as under such conditions the rope often slips and wear is excessive. Where the rope is subject to wet or dampness, rawhide is an excellent material to use, as it is very little affected by dampness.

The cost of rawhide rope will average about six times that of a good quality of manilla transmission rope.

Solid round and square ropes of leather are sometimes used, and steel ropes with leather washers closely threaded on have been tried with considerable success, but the expense of such a rope would necessarily limit its application.

As we have already noted, manilla rope is used very extensively for transmission purposes, but its application has not always met with that success which would follow a more thorough knowledge of its requirements. Inefficient rope drives are erected and run for a few months, or perhaps only days, and are replaced with larger ropes if the sheaves will permit, or, as in many cases, the ropes give way to leather belting and henceforth rope driving is condemned. The true cause is not so much the inefficiency of the ropes as it is the lack of knowledge concerning their use and application.—Flather, in the Electrical World.

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A CLEAN MILL.

By W. T. BATES IN ENGLISH "MILLER."

CLEANLINESS is said to be next to godliness, and in milling is supposed by some people to be synonymous with the manufacture of good flour and financial success. Cleanliness may be a virtue deserving canonization equal with godliness; but I greatly fear that many a canonized saint too often lacked the lesser virtue, and if Eastern "saints" are at all a pattern of the exalted departed, I should not be surprised to learn that uncleanliness in some cases was "accounted for godliness." I have also a strong impression that all the best flour is not made in all the cleanest mills, but in saying this I do not wish to appear as advocating either ungodliness or uncleanliness. As a matter of fact, all of us know of commercially successful mills, which are not models of orderliness, or alhambras of delight; and we know also of carefully kept establishments which are unable to hold their own. I am not attempting in any way to state cause and effect in these cases, but relate them as matters of fact in order to disprove the connection, if any was supposed to exist.

There are untidy people who are never satisfied without they are up to their necks in dirt, and it may be true, as some assert, that a dirty man is never a good workman, his untidiness being the best evidence of his qualification—his character, in fact. While, however, admitting that some men are beyond redemption in this respect it would be quite unfair to generalise and condemn all men as dirty who happen to be connected with an untidy mill. Neither is it fair to blame the management for this state of affairs, and give the mill or system the credit of the financial success. We ought rather to reverse the order of this, and say that the condition of the mill is the fault of the builder, and its success due to the management.

It may be that the old style of milling has something to do with the slovenly and untidy habits of some men. The mill was considered to be clean if it was swept once a day and cobwebbed twice a year, the sweepings being left under the stairs and picked up about once a month; but as the old race of millers is dying out, and the breach between the old and new is ever widening, this reproach cannot long remain.

Our old race of so-called "rule of thumb," but really practical men, is being replaced by what we may with more truthfulness call knights of the broom. The age of millstone milling produced practical, self-reliant, all-round capable men. Their place is not being filled. The working of the mill depends now upon one man. The era of roller milling is the era of brooms and brushes, and of a race of housemaids, whose duty chiefly is to sweep, sweep, sweep, from morning until night. Cleanliness, now, in some mills, takes precedence of milling in its proper sense, except officially. The use of the broom becomes a painful monotony, or, as Mr. Mantellini would express it, "One horrid dem'd grind."

Some mills are dusty because it is impossible to keep them free from dust, owing to inherent defects; for no sooner has a man got to the end, say of a line of rolls, with his dusting, than he has to begin afresh and repeat the process. On the other hand, there are mills which scarcely need sweeping up once a day. But pray don't blame or credit the men or management in either case, for these extremes represent the difference between good and bad arrangement and environment. Only those who have had experience of this sort of thing can understand or appreciate the misery which unpreventable dust and untidiness induces, or the gratification arising from successful endeavors to overcome it.

Having experienced the two extremes, I will give my opinion of what I consider to be the chief causes of dust, dirt and trouble.

First and foremost amongst them all I place the absence of a good exhaust, especially where damp wheat is used. A good exhaust under the rolls ventilates the whole mill; for by drawing the hot air from the rolls the elevators and all dressing machines connected therewith are ventilated. The effect of this is that everything works better, the flour dresses freer, chokes are avoided, dust prevented, and general comfort promoted throughout the mill. This is not a fancy picture; without an exhaust, when milling damp wheat, and especially with dull rolls, sweating takes place, the spouts become

charged with damp moist air, and quickly fill up with a green fungous substance. Chokes inevitably follow, and chokes are the most fruitful cause of untidiness and unsatisfactory work. Besides this the spouts and elevators become rotten, and general discomfort is the supreme result. This state of affairs must also be prejudicial to the health of the workmen, as it assuredly must be to their tempers. We have probably learnt enough about roller milling—costly lessons too—to avoid these failures in our more recent constructions, but that will not cover past follies. In a mill that comes under our cognizance this trouble is so great that a weekly clearing out of elevator bottoms and spouts takes place regularly. Of course, there is always the remedy of applying a proper exhaust, but then everyone does not know its advantages; let us hope that this paper may assist them in this respect.

Another cause of dust, but not now very prevalent, is blowing elevators. Through going too fast generally, but sometimes through faulty construction, a portion of the load is thrown back, and falling to the bottom causes a rush of air and dust from spouts, or even from the roll case itself. This is a trouble sometimes difficult to cure, for it may arise from the elevator being overloaded, and the mischief of it is that every bit thrown back increases the load, but this overloading may be more apparent than real, for sometimes the buckets get clogged—partly filled with an accumulation of sticky dust—and this prevents them carrying their proper quantity. Spouts too upright may also prove a cause of dust by "blowing" in the same way as elevators. A flap valve or two put in a long spout will sometimes entirely overcome this defect, but it is best always to put the spouts at a fair angle, as anything hard will be greatly damaged by heavy falls. I have seen semolina thrown from an elevator down a long spout which not only wore a hole through the spout in a few months, but caused such a rush of wind that it lifted the lid from the purifier hopper. I should call that a fault of construction, although other people might put another construction upon it when they saw the trouble and mess it caused. We must, however, admit that millers and mill builders do not always admit the same construction!

There is no gainsaying the fact that all modern dustless purifiers may be made excellent dust distributors unless the feed is thoroughly dusted beforehand, which is often not the case owing to changes in the condition of the wheat. Arrangements which will dust middlings from dry hard wheat are very inadequate for damp wheat, and unfortunately we cannot always ensure one condition of wheat, even with our modern washing and mangling outfits; hence we find some "dustless" mills very dusty indeed, but, let us also add, some are very free from dust, and also, that this defect is, wherever it may exist, a miller's and not a mill builder's fault. I question the wisdom of close dusting, but I give full credit to the dustlessness of the modern purifier when properly fed.

Mills should always be so constructed that the dirty dust of one department cannot be drawn in to contaminate the pure products in the other. For that reason the wheat cleaning department should be entirely separated from the mill. If dust is once set free in the air, we never know its destination. It may be our lungs, and it may be the pure products of our purifiers, for wherever fans are drawing breath, the impurities in suspension will accompany it. In badly arranged buildings this dirty dust can be seen sticking to the underside of the purifiers, and also covering main drives in out-of-the-way places in the mill. Depend upon it these are not the only places where it settles; the mill is generally affected thereby, and it can be seen in the color of the dust swept from the tops of machines and other places.

In a case I have in mind the dust catchers for the entire mill were placed under the roller floor. As every one knows, nearly all of these machines fail to catch fine dust, and the effect upon all the roller belts and the roller floor can be easily imagined. Fine dust is like smoke, following every current and eddy until it finds a resting-place. Its effects upon the inside of a belt is most disastrous, for no belt can obtain a proper grip when covered with dust. Slipping belts mean trouble, and where the cause is widely distributed, as in this case, the trouble is sure to be correspondingly great.

I should call that a fault of arrangement, and I should not blame the miller for it. If it became a question for compensation, I fancy the sum in question would be large, for I know the trouble is incalculable, and there is small credit given to those who have to battle with it.

Perhaps the greatest difficulty with which a conscientious man has to contend in his endeavours to maintain a clean mill is the general habit of untidiness in workmen. Plenty of men will go carefully through all their machines, polish bearings and brighten shafts, and yet have the mill littered and untidy. It may be an empty sack in a window sill, some waste left in a corner something between the elevators, some grease or oil left upon the floor, even something hanging upon the wall, all of which seem to neutralise or spoil the effect of their otherwise successful labours. Again, with regard to partially filled sacks. I remember going to take charge of a mill and found scores of these little bits of stuff littering up the place. Against every pillar were piled up half-a-dozen, and in every possible corner an even greater number. Everybody had done something to add to the number and yet it was nobody's business, and nobody knew what they were. This is a trouble that wants keeping well underhand or it grows to an awful nuisance.

I think that in some cases a mill cannot be kept clean because it is undermanned. I should like to see a distinction made between millers and housemaids. We imbue our men's minds so thoroughly with this eternal cleaning business that I think they sometimes forget they have anything else to attend to. They are "broom knights" first and millers afterwards, a condition which I must say is not very creditable. We ought also, I think, to do all in our power to reduce this sweeping business to the lowest limit by doing everything possible to overcome its necessity.

Some complain of the waste in dirty mills. There is waste undoubtedly, but waste arises more from chokes; remove this trouble and the other disappears, as showing the difference under different conditions. A mill in which I was engaged worked under the worst conditions above enumerated, the result may be imagined, and imagination could not color the real truth, it was bad enough in all conscience. I now have the pleasure of working under the exact opposite—that is, the most favorable conditions; we have no choking, no waste, and to receive visitors is a pleasure.

The best way to dispose of sweepings, where there is a large quantity made—and badly constructed mills do manage to make a large quantity—is to have a mixer on each floor of the mill. All sweepings are put into these which feed into a short reel, where they are sifted and sent into sharps; or they may be divided and sent partly to sharps and partly to bran. This disposes of them as they are made, and prevents an awkward accumulation, difficult to dispose of.

Of course mills are sometimes dirty through sheer carelessness. A worm lid is left off from day to day, or a spout lid in like manner. A leak may remain unstopped, and yet, for all this, every day the man goes round and sweeps up the deposited dust, leaving the cause as before. It may be too much to expect our "broom knight" to become thoughtful, but until that consummation is arrived at I fear there is little hope for the realization of our dream of purity and light, an absolutely clean mill.



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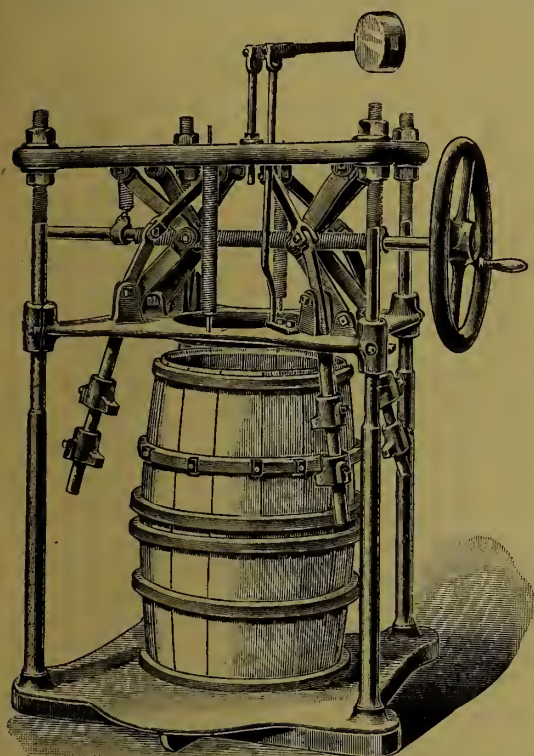


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NEW SERIES "MECHANICAL AND MILLING NEWS"

OLD SERIES, VOL. XI. } NUMBER 9.
NEW SERIES, VOL. IV. }

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6 Greey's Latest Improved Double 9 x 30 Rolls with Counter Shaft, Pulleys and Idlers Complete	\$200 00
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4 Dunlop Flour Dressers with Wood and Iron Gear Drive with Counter Shaft, Complete	100 00
4 Girard Air Belt Purifiers, No. 4, Complete	125 00
4 Whitmore Air Belt Purifiers, Complete	50 00
4 3-Sieve Vibratory Scalpers, Complete	70 00
1 No. 3 Separator	75 00
2 Power Packers with Tubes and 18 Stand of Elevators Complete with Head and Foot Pulleys, Belts, Cups, made sectional and all screw nailed, each stand complete	30 00

A lot of Line Shafting, 3", 2 7/8", 2 7/16", and 2 1/2" diameter, together with Pulleys for driving above Machinery, bored to fit above shafting, all turned Couplings, Air Goods, per lb. 4c. Ball and Socket adjustable Hangers, Babbitted for above, also Pillow Blocks and Post Boxes all adjustable, per lb. 5c. **TERMS CASH, F.O.B.**

Millers wanting anything in this line should not fail to come and see these Machines as a chance to get such goods at less than half-price does not come every day. These Machines are of the latest pattern and are the equal of any new machines on the market.

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OLD SERIES, VOL. XI. } NUMBER 9.
NEW SERIES, VOL. IV. }

TORONTO, ONT., SEPTEMBER, 1894

TERMS, \$1.00 PER YEAR
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CHARACTER SKETCH.

HAROLD BARRETT,

PRESIDENT THE DOMINION MILLERS' ASSOCIATION.

"Time and patience change the mulberry leaf to satin."—Eastern Proverb.

A LITERARY critic has said of the biography of Dr. J. G. Holland, founder, and until the time of his death, editor of Scribner's Magazine, as well as author of such commonsense and widely read works as "Timothy Titcomb's Letters," "Lessons from Life," etc., that it is lacking to some extent in interest because Dr. Holland's career was, for the most part, one of uninterrupted success, which was steadily cumulative—his life wanted the necessity for battle with the world, which has given zest to the lives of so many successful men.

We may envy those who have been born, as the saying runs, with a silver spoon in their mouth, and who are permitted to spend their days on a bed of roses, but after all such lives are often weariness itself.

Mr. Harold Barrett, of Port Hope, Ont., who at the last meeting of the Dominion Millers' Association, was unanimously chosen president for the new year, was early obliged to shoulder the responsibilities of life, and with innate energy and pluck, he has steadily fought its battles ever since. Mr. Barrett was born in Port Hope, Sept. 9, 1858, of English parents. His father was the owner of the local flour mill, and at the age of 13 the younger Barrett went to work in the mill. So that it can be said of him—as of many others prominent in milling circles in Canada—that he was to the manner born. At the age of sixteen the death of his father occurred, and within the next year young Barrett took over the milling business from the executors of his father's estate. A result has been, as a friend has well said: "Mr. Barrett has acquired a varied experience of business vicissitudes from fire, flood and fluctuating markets, and had passed through these long before many young men think of undertaking a business on their own account."

It is sometimes said that this is an old man's age, from the fact that Gladstone, Bismark, Caprivi, Crispi, Pope Leo XIII, Sir Oliver Mowat and others far advanced in years have continued in the lead of public affairs. This from one point of view is true, and yet one cannot exercise their observation without being impressed with the fact that at the head of many of the greatest enterprises and most successful business undertakings of the day are men, who in every sense of the term may be known as young men. This has indeed been the case with men successful in many undertakings. In literature the originators of the Edinburgh Review—Sidney Smith, Jeffrey and Brougham—were young men. Burns and Byron had accomplished their work before they were 37. Newton's best work in science and Watt's in mechanics were placed on record while these men were young. And was not William Pitt Prime Minister of England at 24? Mr. Barrett has in his career, whether as a business man or in a more public way, furnished another illustration of the success that may come to a young man before he has reached 40, for it is to be remarked that Mr. Barrett has little more than turned his 36th year.

In his own town perhaps no citizen is more highly respected than Mr. Barrett. That he holds a high position in the confidence of his fellow-townsmen is shown by the fact that for several years he has held a seat on the council board and to-day occupies the important position there as chairman of the finance committee. He is also one of the Board of Harbor Commissioners who control the Port Hope harbor. The same diligence and business capacity that for 20 years he has brought to bear in the management of his own

business, he has thrown into the affairs of the town, where he was born and has during his lifetime lived.

From the early days of its organization Mr. Barrett has taken an active and intelligent interest in the affairs of the Dominion Millers' Association. He has ever been known for his unassuming and modest demeanor, and he has required just a little pushing by his friends sometimes to place him in the positions of responsibility for which his talents well fitted him. A year ago he was elected vice-president of the Association and in this position he showed himself throughout the year to be a valued member of the executive. Aggressive in his stand against any wrong bearing against the milling trades, he was able to give good service in fighting extortionate freight rates and the furtherance of other reforms during his period of office. At the meeting of the Association last month his fellow members showed their



MR. HAROLD BARRETT.

appreciation of these services by at once electing him to the office of president. He will be known as the youngest president of the Association. Not at any time is he given to much talking, and yet when he discusses any question it has been shown that he has obtained a good mastery of the subject under consideration. His paper on "Doubtful Milling Patents," read at the August meeting, showed very clearly the thorough manner in which Mr. Barrett prepares himself for any particular undertaking. The paper was full of carefully collated information on the subject dealt with, while its suggestions show the practical and common-sense turn that Mr. Barrett gives to any subject that he touches. Following in the footsteps of Thomas Goldie, E. Peplow, M. McLaughlin, and N. H. Baird, though a younger man than any of these, Mr. Barrett may be expected to represent in a creditable and able manner this Association, which is perhaps the best organized and business-like managed millers' organization on the continent.

De Maistre says that: "To know how to wait is the great secret of success," and an Italian proverb has it: "Who goes slowly, goes long and goes far." Mr. Barrett has that strong element of hanging on, or to use a more modern phrase, sticktoitiveness, that it has well been said is the true spirit of genius, and that brings certain success wherever exercised. Mr. Barrett from boyhood days has always "got there," and as the executive head of the Dominion Millers' Association this year his record will no doubt be one of equal success.

RUSTING OF BOILER SHELLS.

IN a paper read in Germany on the rusting of boiler shells, the author concludes that the most serious cause is the introduction of air with the feed water. If the feed water enters the boiler near the low-water level he concludes that it will soon be expelled with the steam, unless it has a chance to accumulate in pockets. Such pockets rust rapidly. The feeding, he advises, should be completed before stopping for the day, so that the water standing in the boiler over night shall be as free from air as practicable. Faulty construction, the author believes, is the frequent cause of internal rusting. For preventing rusting he recommends: First, while the boiler is working—(1) Removing the air from the feed water before it enters the boiler. (2) Removing air from the water while in the boiler, and preventing its accumulation in pockets, etc. (3) Addition of chemicals to the feed water. (4) Protective coatings applied to the inside of the shell. Second, while the boiler is standing idle—(1) Removing all moisture from the boiler, (a) by blowing it off while hot, (b) by producing an air current through it, (c) by placing hygroscopic bodies inside. (2) Direct protection of the shells, (a) by painting with tar, varnish, etc., (b) by covering with protecting the shells from varying temperatures by keeping the draft in the flues constant, and so as to prevent moisture alternately depositing and evaporating on the shell. (4) Protecting the shell by completely filling the boiler with water from which all air has been expelled.

MICROBES IN BREAD.

DOCTOR Troitzki, writing in the Russian medical periodical Vrach, states that he has found that new and uncut bread contains no micro-organisms, as the heat necessary to bake the bread is sufficient to kill them all. As soon as the bread is cut and is allowed to lie about uncovered, not only harmless, but also pathogenic, microbes find in it an excellent nutrient medium. White or wheatmeal bread is a better medium than black or rye bread, as the latter contains a greater percentage of acidity. Dr. Troitzki's experiments with pathogenic bacteria gave the following results: Streptococcus pyogenes aureus retains its vitality on the crumb of wheatmeal bread for 28 to 31 days, on the crust for 20 to 23 days; the bacillus of anthrax (without spores) remains alive on the crumb for 30 to 37 days, and on the crust for 31 to 33 days; the typhoid bacillus remains active 25 to 30 days on the crumb and 26 to 28 on the crust, while the bacillus of cholera lives 23 to 25 to 27 days on both.

EXPORTS AND IMPORTS OF WHEAT.

THE following table exhibits the approximate exports of wheat from the following countries for the twelve months ending July 31:

	Bushels.
United States and Canada.....	157,280,000
Russia, Poland S. E. Europe.....	138,400,000
India.....	20,000,000
Austria-Hungary.....	8,640,000
Argentina.....	48,000,000
Australia.....	8,800,000
Chili, North Africa, etc.....	11,200,000

Total.....392,320,000

The imports into the following countries for the same period was as follows:

	Bushels.
United Kingdom.....	176,000,000
France.....	56,000,000
Northern Europe and Switzerland.....	80,000,000
Italy, Spain and Portugal.....	42,400,000
Scandinavia.....	10,000,000
Greece.....	2,800,000
China, etc.....	20,000,000

Total.....387,200,000

TRANSPORTATION: OUR WATERWAYS.

TWO IMPORTANT CONTRIBUTIONS ON THE SUBJECT.—MR. JAMES B. CAMPBELL, OF MONTREAL, WRITES A SPECIAL ARTICLE FOR THE "MILLER."—VIEWS OF MR. JAMES FISHER, M.P.P., OF WINNIPEG.

FEW more important questions of a commercial character are before our people to-day than a consideration of the best course to pursue in the development of our waterways. It may be expected that the coming international convention to consider the subject, and which is to meet in this city very shortly, will throw some light on the question. The fact that such a meeting has been called, and that leading citizens of Canada and the United States are interesting themselves actively in the matter, may be taken as good evidence that the question is a live one.

The MILLER has already published several contributions on the question, and this month further supplements these by an article specially written for these columns by Mr. James B. Campbell, of Montreal, in which the Welland Canal, as a factor in proposed plans, is discussed. And following Mr. Campbell's paper are the views of Mr. Fisher, M.P.P., of Winnipeg, who has been a close student of the subject for years.

WHAT MR. CAMPBELL SAYS.

It is with pleasure I notice that the CANADIAN MILLER invites discussion on the important problem of transportation in Canada. If by throwing your columns open to the question, you can lead Canadians on, either to criticise or to suggest improvements, the whole question of transportation is certain to be a gainer thereby.

The problem for us is, the transportation of the product of the great West to the consumers in Europe. There is no system of transportation by land which can compete in cheapness with the transportation by water, represented by a carrier of say 100,000 bushels in bulk down through the great lakes. The watershed of the United States drifting to the Gulf of Mexico has been of little use to the Americans of the Northern States, and they have bent all their energies to something else; a great development and a keen competition in their land carriage has led some people to imagine that the railway and not the watercourse was the true vehicle of transportation. In our country a glance at the map will convince anyone that a great development of business along our watercourse should be the aim of our business men and of our statesmen entrusted with power. Our watershed, clear and distinct from that of the United States, extends from the Rocky Mountains through our land to the Atlantic, and represents the artery of life for our country. It is true that this great artery is closed for 5 months in the year, but so is the whole transportation service of the great lakes, and the more the North West develops, the more evident it becomes that their future is dependent on this season of open water for its transportation. Far be it that I should depreciate in any way our railway system, more especially that portion of it west of Port Arthur, without which we could not have opened up that great empire in the west; however, transportation by water east of Port Arthur is the portion of our watershed up for discussion at present.

These general remarks are preparatory to taking up the question to which this letter is devoted—the Welland Canal. The proposition to deepen the canals has become crystallized. Almost every writer and public speaker seeking to account for the stagnation of trade on the St. Lawrence route, seeking to account for the fact that Montreal tranships 25 millions against Buffalo's 200 millions, winds up with, "Deepen the canals." Competent engineers assert, I believe, that to deepen the Welland to a level of 20 feet, would mean an expenditure of 15 millions of dollars. The question is, Would it pay? Why is it so easy for grain to drift to the sea via Buffalo, and so difficult to bring it our way? In the answer will be found the answer to the question, "Would it pay?" The general modern tonnage of the upper lakes is now represented by vessels of 300 to 340 feet in length, and our Welland locks are only 270 feet; consequently for freights through to Kingston or Ogdensburg we are dependent on the smaller freighter and generally speaking the older boat. It is the larger vessels that make the freight rates, and as the older and smaller boats fall out, it is probable that it will become more and more

difficult to get capital to replace them. The season during which these lake craft can earn a dividend is short; freight rates are low, it is difficult to see what is to advance them, and their only salvation lies in the number of quick trips at the low price. The time for a propeller from Chicago to Port Colborne or Buffalo is about 4½ days. Our Welland has 26 locks, and a vessel making the trip in and out of Lake Ontario loses from 30 to 40 hours in that canal. A vessel owner will not voluntarily surrender that time, except at a compensating rate of freight, and the moment higher rates are established, the route is handicapped with the extra charge. This would apply with the same force were the locks 350 feet and their depth 20 feet. Towards the close of navigation, when the pressure of fall shipments is on, this loss of time in the Welland is a very serious consideration, and is a damper for the Canadian route. As an illustration take the rates of freights to-day—wheat is being carried from Duluth to Buffalo for 1¼ a bushel and on to New York for 3 cents—4¼ in all, while so light is the trade via the St. Lawrence, that it is difficult to get Welland canal vessels under 2½ cents to Kingston, tolls paid, and with the 2½ river freight, say 5 cents to Montreal. The largest carrier is the cheapest freighter; it will make the freight rates and take the trade with it. Until that far distant day arrives when Chicago elevators move out to the breakwater, capital investing in lake tonnage for general business will limit the draught of the vessel to the depth of water in the Chicago river; this river is narrow, its banks are muddy, and notwithstanding decrees at Washington, I doubt if it will ever stand dredging to 20 feet. If my memory does not deceive me, the depth at present is 15.6 and to call the last six inches water is to insult tectotallers. I have frequently seen the ordinary Buffalo propellers stuck in the sediment at the Clark street bridge. It is not the want of water in the Welland which sends the grain to Buffalo, for there is really very little difference between the Welland and the Chicago river. The reasons are, the shortness of the locks, the time lost in the canal, no return cargo, the limited amount of ocean tonnage at the Port of Montreal, sundry charges which should be borne by the nation, and the unlimited amount of ocean tonnage at the Port of New York. That is what is the matter with our trade.

Until we have a larger freight market at the Port of Montreal, there is not the slightest use in spending money on increasing the depth or lengthening the locks of the Welland. The only way in which we can increase this freight market is to buy more stuff where we hope to sell. The true solution, I think, for trade via the Welland is a transportation company, transshipping the grain at Port Colborne, into wooden barges and freighting it straight to Montreal. The vessel owner at Chicago, Duluth and Port Arthur would carry the grain to Port Colborne at Buffalo rates in competition, he would not figure on time lost in the canal; if we could not supply him with a return cargo, it would be no trick to run into Buffalo light, get his return cargo there, and travel west as happy as his rates of freight could make him. By this means we could make use of the United States west bound traffic to help our shipments via the St. Lawrence, until such time as we created a through trade of our own. Arranging our affairs to take advantage of the Buffalo coal trade would be a point gained for us, and western men equally with ourselves would reap whatever advantage there was in it, but so long as we depend upon the Welland canal only, we can never hope to do the business which our favorable position on this continent would seem to justify. The canal is, however, quite sufficient for the Montreal freight market at present. If we could not barge grain from Port Colborne to Montreal in 50,000 bushel lots cheaper than from Buffalo to New York via the little Erie in 6,000 bushel lots, there is no use in patting ourselves on the back over our natural water route. The demands of marine insurance, that such lake vessels carry sails, could easily be covered on 50,000 bushel barges, and the tow come on to Montreal. Do not let us hear anything about more elevators at Port Colborne. Put the price of the elevators into barges, we want the stuff to come through not stop there. At Buffalo the little floating elevators forced the big land elevators to buy them out. Cheap floating elevators will beat land elevators out of the transfer

trade. Such a transportation company would, however, have to be one of large capital. At Port Colborne the propellers would come into harbour from Chicago, Duluth and Port Arthur, with 100,000 bushel lots, and would have to be unloaded promptly, with the present depth of our river canals and channel, and at the rate they are giving this much talked of deepening of that important part of our route to 14 feet, will see two elections and ten years time pass over our heads. The grain would have to be transferred into 4 or 5 barges, these barges would have to be camped out for at least a fortnight, and others ready to take their places. The season is short in which to make a dividend, and with our little bit of a freight market at Montreal, a Welland and Montreal transportation company would not make expenses. To do the thing right it must be prepared to handle the western trade on a western basis, and there is not the tonnage at the Port of Montreal to do it. With more freight room, and 14 feet of water in our river channel and canals, barges freighting 50 to 60 thousand bushels, Port Colborne to Montreal, preserving the identity of the grain, especially the fine spring wheat of the north, would leave New York with its larger freightage and little 6,000 bushel boat loads high and dry at competing prices for the spring wheat trade, but a larger freight market at Montreal is an absolute necessity. As to what could be done in the way of increasing our ocean freight market, it is only necessary to quote a well known axiom: "Those who can reach the markets of the world cheapest, shall control the markets of the world"—and it applies with the same force to imports that it does to exports.

The general conclusion is, that until there is trade enough to push a transportation company on the Welland-Montreal route, to the full capacity of that canal, it would be very little benefit to the country enlarging it. When that day comes it might pay better to build another, for there would not only be room for two, but for many other transportation routes through Ontario. Mr. Hill, President of the Northern Pacific Railroad, said, Canada has advantages which are peculiarly her own, and that there was room for a far greater development of trade than most people imagined.

At the moment of that earthquake last spring in this city, I was talking to the owner of these fine English turret freighters which are now doing such good work on the St. Lawrence for our coal companies. It is quite possible to build a "turret" freighter for a 14 foot draught of water capable of carrying 90,000 bushels of grain through from the lake ports to England—but all the canal locks would have to be lengthened.

Regarding this business of loading at the lake ports; cheap craft of say 3000 tons represented by those "turrets" might possibly do it, but they would have to compete with the 12 or 14 thousand tonners of the ocean loading at an ocean port; the cheap craft of the lakes with a tow of barges would more than hold their own, while the turning of the grain once would be a decided advantage to the grain, and with regard to corn almost a necessity. The time lost in those numerous canal locks would prevent as expensive a ship as a 20 foot ocean freighter loading at a lake port in competition with cheaper tonnage. The "whaleback", suitable for the lakes is a failure on the ocean; the "turret" is still experimental for the sea and lakes, but it has established itself on our river to stay. I learn from an independent quarter that they are paying 10% on their cost—notwithstanding dull times. Let us have the 14 foot channel as quickly as possible.

A VOICE FROM MANITOBA.

Mr. James Fisher, M. P. P., of Winnipeg, Man., when in Toronto a fortnight ago, gave expression at some length to his views on the subject of transportation and the benefits that he believes would accrue to Canada, and particularly the Northwest, by an extension of our waterways.

"The people of Manitoba," said Mr Fisher, "are becoming more and more alive to the great importance of the deepening the channels. I believe the opinion is every day gaining ground that the surest means of deliverance from the present ruinous freight rates is to be found in the deepening of these waterways."

"What we are specially anxious for at present is to

see a speedy completion of the work now on hand, namely, the deepening of the channels to 14 feet. That once accomplished will, I am convinced, bring about of itself a very considerable reduction in the cost of transportation.

"With even a 14-foot channel the great cost and delay in transportation by barges through the St. Lawrence will be avoided. Capt. Macdougall's whalebacks will bring down to Montreal immense loads of grain without breaking bulk.

"Indeed one steamer with two barges in tow will bring a quarter of a million bushels in one load, thus cheapening very materially the cost of carriage.

"We are hoping, however, that the idea of a further deepening of the channels until we have a uniform depth of 20 feet all the way to the sea will be agitated on both sides of the line, and that finally the two nations will undertake it as a joint enterprise.

"When I say that the lakes and rivers are the heritage of both nations equally, I mean that is so in respect of all the water, right through to the ocean. It is manifestly so from the head of the lakes to the point on the St. Lawrence where the line of the international boundary leaves the river, and it is only in respect of the short distance between Cornwall and Montreal that the St. Lawrence can in any sense be called a Canadian stream, and then it must be remembered that for even that portion of it the right of American citizens to use it on equal terms with Canadians has long since been conceded by treaty, and that treaty is not by any means an ordinary one, in so far as it deals with the use of the St. Lawrence.

"Usually such a concession is made by one country to another as an equivalent for an advantage conceded by the other side, and for a limited time. In this case on the contrary, the American people always claimed that they had a right to use the St. Lawrence, irrespective of treaty, because it was a passage between two bodies of water that were common to both nations, viz., the great lakes and the Atlantic ocean."

Speaking of the difference in cost of transportation by water and by rail, Mr. Fisher said:

"There is no doubt whatever, upon this subject," answered Mr. Fisher. "The difference, indeed, is most remarkable, and possibly few recognize the extent of the reduction made where water transportation is available. As illustrating this difference in respect of transportation from the Northwest, I may give you a few examples. Our great staple in Manitoba is, of course, wheat, and it is most disheartening to feel that half the value of the grain in the English market is expended in paying the cost of transport to that market from our province.

"The greater part of our grain is taken by rail to Fort William and is thence carried by water either to Buffalo or to Montreal.

"The rate from Brandon to Fort William, a distance of 560 miles, is 11.40 cents per bushel; this, of course, is by rail. From Chicago to Buffalo, 900 miles, the rate by lake is from two to three cents per bushel. In 1891 it was less than two cents on the route (from Chicago to Buffalo by water) and it has been as low as one cent per bushel.

"From Duluth to Buffalo (by water), a distance of 1,000 miles, I understand, the usual rate is between three and four cents per bushel, the average for some seasons having been as low as three cents. From Duluth to Montreal (by water), nearly 1,400 miles, when competition is keen, I understand the rate is from six to seven cents per bushel.

"From Winnipeg to Montreal (by rail) the distance being only a few miles greater than from Duluth to Montreal, the rate is about 27 cents. The average all rail-route from Chicago to New York in 1891 was 15 cents per bushel, while the average rate by lake and canal between the same points was less than 6 cents, and this although at Buffalo it had to be transferred to the canal barges on the Erie. Again as against the rate of 11.40 cents per bushel from Brandon to Fort William, I refer to the rate of from 2¼c to 3c per bushel from Buffalo to New York by the Erie canal and Hudson river, nearly as long a distance.

The average yield of wheat in Michigan this year is slightly under 15½ bushels per acre.

CAUSES OF FLOUR MILL FIRES.

A CONTEMPORARY has, recently, published a number of diagrams showing the causes of fires by classes of property. The diagram given herewith shows the causes of fires in flour, grist and oatmeal mills. It requires no explanation further than to say that the periphery of the circle is divided into 100 parts. Each part between the little marks on the inside of the circle represents 1 per cent. To ascertain the percentage of fires due to any cause, count the number of per cent. marks in the arc of the segment given to that cause. In preparing the diagram no attention was paid to exposure fires, incendiary, nor to those of unknown origin.

Fiction seems to be the miller's greatest enemy, nearly one-third of the fires being caused thereby, while the much feared dust explosions are reported to have

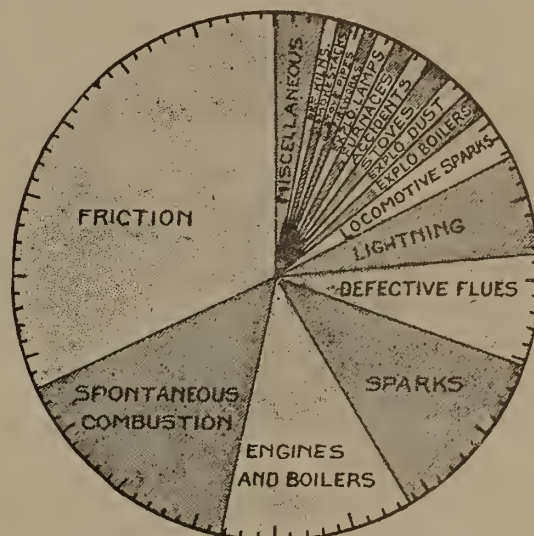


DIAGRAM SHOWING CAUSES OF FLOUR MILL FIRES.

caused but 2 per cent. of the fires. Among the causes of fires which could easily be prevented with ordinary care are friction, spontaneous combustion, defective flues, boiler explosions, furnaces, stove pipes and defective kilns.

Good oil of the proper viscosity properly applied to correctly arranged machinery will prevent fires being started by friction. Spontaneous combustion does not occur in mills where oily rags, dirt and refuse matter is not permitted to remain in corners and out of the way places, and the floor is not flooded with oil drippings from bearings. The coal pile which is a prolific source of spontaneous fires should be kept in an adjacent building by itself. Defective kilns, flues and furnaces and weak boilers and poorly jointed stove pipes are inexcusable sources of many fires.

The diagram clearly shows that the majority of mill fires are due to carelessness on the part of the miller. If you do not wish to lose your mill take care to prevent fires being started, and provide facilities for extinguishing them in their incipency.

MEAN EFFECTIVE PRESSURE.

OF course the actual mean effective pressure in the cylinder can only be had from the indicator card, but we can approximate it closely enough for calculating the power of the engine commercially, though perhaps not exactly accurately.

This will vary with the different engines, the clearance, the back pressure and the release of the exhaust will affect it somewhat, but a few figures for different cut-offs will be useful for the engineer.

The mean effective pressure in the cylinder when the cut-off at

- 1-4 stroke equals .597 of boiler pressure.
- 1-3 stroke equals .670 of boiler pressure.
- 3-8 stroke equals .743 of boiler pressure.
- 1-2 stroke equals .847 of boiler pressure.
- 5-8 stroke equals .919 of boiler pressure.
- 2-3 stroke equals .937 of boiler pressure.
- 3-4 stroke equals .966 of boiler pressure.
- 7-8 stroke equals .992 of boiler pressure.

For net effective power deduct about one-fourth for friction of engine in engines of fair size, and for small engines as high as 50 per cent. is often lost, making a far less efficient motor than the electric motor, provided the cost of power supplied to them was both the same.

BELOW COST OF PRODUCTION.

THE popular theory of wheat being below cost of production, says the Trade Bulletin, of Montreal, has been one of the chief incentives to speculative investments therein ever since the price fell below the eighties. The great bulk of speculators have, therefore, argued that as wheat could not be produced at the prices it was selling at, it was consequently a safe purchase. When the price of wheat dropped "from the seventies into the sixties" there was a perfect craze on the part of outsiders for the possession of wheat, and wheat they got, on margin of course, as it was then considered that a 5c. margin could not possibly be wiped out, it being considered as safe as buying the wheat straight out, and putting it into store. Despite the continued cry of this cereal being below cost of production it fell and fell, until investors commenced to loose faith in the theory, and many had to relinquish their deals when September option dipped below 55c. at considerable loss. The "below cost of production" theory has been shown to be a very unreliable index in a number of instances of future values. For instance, when pork in Chicago sold at \$11.40 some years ago, it was said to be below cost of production and could not go lower, and yet in a few months afterwards it sold down to \$8.20 and had previously sold as low as \$6.50. Lard also sold as low as \$5.25, although its lowest first cost was said to be \$7. On the basis that pot ashes could not be produced under \$4.50 per bbl., a large dealer in this city, a number of years ago, laid in a considerable quantity, and in spite of the theory he had so much confidence in, prices fell to \$2.50 and \$2.60 and even at these prices farmers continued to bring in their supplies, and the result was heavy losses to the dealer referred to. We mention these circumstances to show that the cost of producing any article is no guarantee of values falling below that basis. At the same time we cannot recall any unusual depression in values that was not followed by a reaction within a reasonable period. Wheat, however, has broken the record in this respect, as values have receded almost continuously during the past three years, and it is about time that a pronounced reaction from the unprofitable rates that have ruled of late took place. Since August, 1891, there has been a gradual decline from \$1.13 per bushel to 50½c. in cash wheat in Chicago, or a drop of 62½c. per bushel, which is about 10c. more than the total cost of cash wheat at time of writing. So that when the re-action does set in for good, there would appear ample room for a rise.

A CLOSE CALL.

ANOTHER narrow escape by an engineer: He was inspecting one of a pair of boilers. The water had been blown out of one, and he entered it through a small manhole in the head. After finishing his work he called out to his assistant to turn on the cold water, thinking to make his way out immediately. By mistake the fellow turned on the scalding, streaming stream from the other boiler, the hissing and pouring of which made a doubly dense roar in the resounding cylinders, and coming at the entrance of the manhole effectually barred the exit, and made escape from a terrible death almost impossible. Creeping as close as he dared to the seething steam he shouted to his aid to turn off the water. He could hear the fellow moving around among the pipes, but waited in vain for him to come. The man had not heard him. His voice was stopped by the hissing, boiling, mocking water. It was rising among the pipes, at his feet. A few moments more, he thought, and he would have been cooked alive. There was but one chance left opened—to force himself through the scalding water and out the manhole. Delay any longer would be fatal, and he plunged face and hands through the cooking stream into the air beyond. Just then the steam stopped. It had been turned off at last.

According to the latest advices from Russia, this year's crop will not be much above a fair average, that is to say less than 30,000,000 quarters in European Russia (including Poland, but excluding the Caucasus,) against 40,000,000 quarters last year, but the large reserve of old wheat from last year's crop will enable Russia to fully equal last season's export of 13¼ million quarters.—Beerbohm.



PUBLISHED ON THE FIFTEENTH OF EACH MONTH

—BY—

C. H. MORTIMER

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THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

VALEDICTORY.

IT has been determined to discontinue publication of THE CANADIAN MILLER with the present number. During the six months it has been under the present management efforts have been made to put it on a satisfactory business basis. These efforts have not met with the degree of appreciation which would justify the publisher in devoting further time, money and attention to the paper, hence the decision to cease publication.

Only about one-third of the millers of Canada apparently feel any interest in having a publication devoted to their business. The others are well-nigh hopelessly apathetic regarding this or any other matter which indirectly affects their interests. There are more profitable tasks than that of endeavoring to keep men awake to their own interest, and to these our attention will in future be directed.

Our thanks are due and are hereby tendered to those who have by their subscriptions and advertisements made it possible to continue the publication of THE MILLER to the present time. To those whose subscriptions are paid in advance we will supply for the balance of the term for which they have paid, either the CANADA LUMBERMAN or the ELECTRICAL NEWS, as they may desire. Those whose subscriptions are in arrears are requested to forward the amount immediately to this office, in order that their accounts may be closed.

C. H. MORTIMER.

FIRES AND INSURANCE.

Two distinct problems are embraced in the title we have given to this article, and yet each is related to the other so intimately that they can be well considered together. In the July MILLER it will be remembered we published in full an able and comprehensive paper on flour mill insurance, read recently before an American Millers' Association. Elsewhere in this issue we publish two separate papers on the question of fires in flour mills. This is giving considerable attention to one subject and yet not a whit more than the subject merits. The loss each year to millers through the devouring element is something that may well cause them to halt and ponder as to the cause, and a remedy. According to the report of the Secretary of the Dominion Millers' Association, presented at the last meeting, nine millers, out of membership in the Association, suffered losses, during the past year and in almost every case of considerable amount, through fire. The one question is, what is the main cause of so many fires in flour mills? The answer, according to the papers published in this issue of the MILLER, places the responsibility in a large measure, either on the faulty character of the construction of mill buildings, or upon the carelessness of the miller and his associates. Both these evils are within the power of millers to remedy. There can hardly be any doubt that there is large room for improvement in the manner of constructing flour mills, just as there is,

though perhaps in a lesser degree, in the construction of factories generally. An exhaustive article by Mr. Edward Atkinson is published in the August number of the Engineering Magazine on the annual fire waste. Mr. Atkinson is able to speak on this question from many years of study and observation and his conclusion is that architects and builders, property owners and occupants, are to blame in nearly all cases for the destruction by fire of their properties. This phase of the subject is one worthy of careful thought by millers. As to the charge of carelessness as the cause of many fires, there can only be words of disapproval from the candid friend. It has long since been established that nearly all accidents that occur to workmen in factories are due to their own carelessness and it seems to be none the less so as regards the destruction of property by fires. He who hath ears to hear, let him hear.

The paper in our July number on flour mill insurance was an out-spoken declaration against the hardships to be endured by the miller, when fire has overtaken him, and he is called upon to adjust his fire losses with the insurance companies. The complaint is not a new one against those whose business it is to adjust fire losses. We do not know why there should be any difficulty on this score. Whatever may be the reading of a fire insurance policy when it is read outside of the blackened walls of the mill there can be no doubt that when the policy was given, the application signed by the miller, and the premium received by the company or its agent, that one purpose only was supposed to have been attained, namely, that when the time came, if it should come, when fire had destroyed the property insured, the insurer would receive the amount named in his policy and for which he had been paying a premium for either a shorter or greater length of time. Legislation ought to make it so plain that it would not require the services of the law courts to decide how much, or how little rather, too often, the insurer is to receive when loss has been suffered. Millers should agitate in this direction and in the meantime they cannot be too careful when placing insurance to read with care and critical mind the wording of the policy that is supposed to give them protection in the time of need and for which they are paying.

The three papers to which allusion has been made in these comments are deserving of careful reading by all millers and one purpose in touching on the matter here is to secure for them the deserved study.

THE SMALL MILLER.

Is the small mill to become before long simply a matter of tradition? This question is suggested by not a few changes in the milling situation, that have taken place of late years. The growth in the number of large mills gives an impression in this direction. An interview in last month's MILLER with Mr. Jas. Stark, of Paisley, Ont., was an expression of opinion along this line. The big miller holds a place in the milling industry now of almost every country. The changes that have taken place in methods of milling have doubtless had a good deal to do with strengthening the position of the big miller, while at the same time, these have to some extent operated against the small miller. It is the men who are in business in a more limited way in any calling who experience the greater difficulty in conforming to changes in methods and adapting their properties to these changes as they come along. A British agricultural journal remarks on this point: "It is only too well known that in this country the great improvements in milling machinery made in recent years, and the extreme severity of competition resulting, partly from economy in the production of flour upon a large scale, have crowded out of the industry a great number of small millers. Thousands of the wind mills which form picturesque features in our landscape and some of the water mills have been allowed to fall into decay, and to be closed down, or to be closed, remaining as pictures of ruin, which all disinterested witnesses regret to see."

This, however, is just one side of the question. We have to admit that viewed alone the case looks somewhat discouraging for the small miller. But a writer in the Milling World has pointed out that not only is the small mill a success in the United States, despite the

large growth of the big mills of late years, but that in other countries the same history is to be recorded. France does the bulk of her flour making in small mills and her largest mills are the ones that suffer first and most in times of stagnation. The same is true in Germany and in Austria-Hungary. Even in Great Britain, affirms this writer, the small mill has come to the front and is successful in the main, when the large mills are running at a loss or on a discouragingly small margin of profit. Viator, a frequent contributor to the London, Eng., Miller, said on this subject recently: "Scattered all over the land are roller millers of 2½ to 5 sacks capacity who will tell, and what is more, show you, that they are holding their own against native and foreign competition. In almost every case the miller has the same tale of a once flourishing business, threatened or broken into by roller flour, being saved by a timely adoption of the roller system. The natural inference is that those who adopted a sound roller system early in the eighties must have quickly recouped their outlay. Of course, it is always presumed that these bold pioneers were also good millers, sound judges of wheat and clever market men. Given these three qualifications, with a good plant and with fair facilities for receiving wheat and forwarding flour, it is hard to conceive of a miller failing to prosper."

The position of the man who is engaged in flour milling in a small way is hardly parallel with, nor is the same conclusion to be drawn from the situation, as in the case of the man who may be engaged in other lines of manufacture in a restricted degree. In a rural country, at least, and how much better would be the position of some of our older countries if the rural sections were not sacrificed at the altar of the large cities, the small flour miller holds an unique position. His existence is necessary to the success of the country around about him and the anxiety displayed by farmers in all newly settled countries to have placed in their midst a flour mill is evidence on this point. So far as Canada is concerned our millers, whether great or small, are holding their position, we believe, even in these depressed times, with any other branch of manufacture. We are inclined to stand in with the Milling World and say that a careful review of the situation should not cause any alarm to the small miller.

IRRIGATION.

At a time when those interested are at a loss to decide what is the most profitable way to work the land so as to hold to the farming community those who are already located there it seems a work of supererogation to discuss any project which means the improving of waste lands so that they may be populated. But as studies in political economy seem to show we get back to the land as the original source of wealth in every case and though difficulties may beset the question just for the moment, we may make sure that those who seek the farm as a source of livelihood will in the end hold an advantageous position. So it is that we cannot look upon the Irrigation Congress at Denver, as a gathering discussing a question that is of no particular import. In what is known as the territories west of the 98th meridian there is to be found an immense arid district in the United States. Seventeen states and territories alike wholly or in part are within its confines, which embraces two-fifths of the national domain. The work of the Denver convention will be to discuss the possibilities of transforming this vast desert into a fruitful garden by means of irrigation. Already practical work has been done in this direction in the United States, and the census of 1890 shows that a total of 3,630,000 acres was under irrigation in the States composing the arid regions. In view of the fact that the regular farming lands of the country in the States are well taken up it means much for that country if its land resources can be added to by the utilization of this immense arid territory. What has been done shows that lands not worth \$1.25 an acre a year ago now command \$30 and \$70 an acre for improved farms and from \$300 to \$500 an acre when covered by bearing orchids. Our own Northwest is interested in a large degree in the success of irrigation methods and the Hon. Mr. Daly, it is expected, will be in attendance at the Denver convention and no doubt will be able to secure valuable information on the question.



CAPTAIN McDougall, the builder of the whalebacks, writes from Duluth, to the Deep Waterways Committee: "I am in favor of a 20-foot channel from Lake Superior to the sea, via the St. Lawrence route. I have given the matter a great deal of consideration, having travelled by the route many times. From what I know of the route and the kind of vessel best suited for cheap river and lake transportation, also of ocean trade, port charges, cost of transfer, the requirements of cargo stowage for an ocean voyage, the different class of men to manage ships on the sea and the lakes, I feel confident that the most profitable plan would be to transfer at Montreal and Quebec. I have just visited the Sault Ste. Marie Canal and think every Canadian has reason to be proud of that work, for doubtless it is the greatest canal construction ever known in so short a time."

* * * *

Mr. Thompson, manager of the Ogilvie Milling Co., Winnipeg, who recently returned from an extended trip throughout the grain district of Manitoba, gives a very gratifying account of the crops, which he says will yield far better than has been generally counted upon. The quality is decidedly good, being nearly all No. 1 hard. Mr. Thompson has made a study of the smut question and has not found a great deal of smutty wheat in his travels. He is a firm believer in the value of blue stone as a preventative of smut and wherever this has been freely used the evil has generally been eradicated. Mr. McGaw, of the Lake of the Woods Milling Co., has also spent a considerable period driving through Manitoba examining the crops. Considering the dry weather that has prevailed this season, Mr. McGaw finds the prospects almost better than could be hoped for. The crop has rather improved since July 1st. There are some fields that make a heavy stand of straw, but light straw is the rule. There is more smut than last year in some parts, but the weather has been fine for harvesting. The general condition of the crop, Mr. McGaw believes to be, if anything, rather better than last year in point of yield, and in quality will also approximate that of last year.

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The Hon. John B. Manning, of Buffalo, who is considered a high authority on the subject said of the effect of the change on barley schedule as amended by the Wilson tariff: "Under the McKinley bill a duty of 30 cents a bushel specific was imposed on barley. The present law makes it 30 per cent ad valorem. The present price of Canadian barley in Canada is 40 to 45 cents a bushel. The duty, therefore, will amount from 12 to 13½ cents a bushel, a difference in favor of the lower duty of 16½ cents a bushel. Strange as it may seem, the rate under the McKinley bill was a detriment to the growers of barley in this state. The high duty prevented the importation of Canadian barley to any extent. The result was that the brewers and malsters of this State declined to buy State barley unless they could buy it on the basis of the value of western barley. Previous to the passage of the McKinley tariff bill, when the importation of Canadian barley amounted to 10,000,000 bushels a year, instead of it being an injury to the interests of growers of barley in this state it had the opposite effect. State barley grown in the counties of Erie, Niagara and Orleans on the average is nearly as good in quality as Canadian barley, and sold within three to five cents as much per bushel, but when the prohibitory duty was placed on the barley and little or no Canadian barley imported, the brewers of this state said there was not sufficient good barley grown in this state to supply their wants, and decided to use substitutes for the better grades of barley malt, and confined their purchases to malt made from western barley. The result was that the price of barley was forced down to the basis of the better grades of western barley, and the interests of

growers of barley in this state were correspondingly injured. We may therefore reasonably look with a lower rate of duty for increased importation from Canada, and this will benefit not only the brewing and malting interests, but also the agricultural interests for the state."

* * * *

Mr. W. D. Matthews, the large barley buyer of this city, says of the United States tariff bill in relation to the barley trade of Canada: "While Canada will recover a portion of the trade she lost under the McKinley bill, it will be difficult to regain our lost position entirely. I refer particularly to the barley trade. The Americans have given more attention to the cultivation of this grain since the passage of that bill, and have very much improved the quality of their barley. In addition to this the improved system of growing and the use of substitutes does not necessitate the use of high-class grades as formerly, and therefore they will not pay as great a premium as formerly to obtain high Canadian grades. One thing our farmers must not forget. They are at a disadvantage in the American market even though there was no duty at all. In addition to the 30 per cent. duty there is to be considered the cost of reaching their market to compete with their home-grown grain. This will average about 10 cents per bushel. It will be difficult for us for these and other reasons therefore to entirely regain our barley trade except in years where the Americans may fall short in their supply."

* * * *

A Chicago despatch of a few days ago says: "Minneapolis mills, which were using 4½ bushels of wheat for a barrel of flour, are now using 5 bushels and 45 pounds, so as to throw as much as possible into the bran for feed, for which there is an active demand. This will make a difference of 100,000 bushels of wheat a day at that point alone." Mr. M. McLaughlin spoken to about this matter said that the above statement was likely an exaggeration of the real facts. He was using more wheat to the barrel of flour for the same purpose but found that about 7 lbs. was all that could be added profitably. He was now using four bushels and 37 lbs. as against 4 bushels and 30 lbs. previously.

* * * *

Senator W. D. Washburn, of Minneapolis, the well-known and extensive flour miller was in Montreal a week ago and interviewed on trade matters said: "I certainly expect prices for wheat to go up; but just what figure they will reach I would not like to say: in fact, I do not attempt to guess it. Of this, though, I am pretty firmly convinced. Prices will never be as high as they have been, and I do not think we shall ever hear of the price exceeding the dollar, unless we have some great wars or famines, restricting agricultural operations in any of the great grain-producing countries." Do you expect prices to go any lower? "No, I do not see how it could, for wheat is really worth more, and at the present prices proves a profitable investment for hog raisers to feed to hogs, and their demand for the grain will prevent the prices from falling any lower, for they are buying immense quantities of it." Will the present low price of wheat tend to reduce the acreage of this grain under cultivation do you think? "Unquestionably it will, for the farmer cannot clear himself, much less make a profit, at the present prices. He cannot afford to raise a crop at a dead loss, and will vary his crop. There will be many thousands of acres less under wheat in my own State, Minnesota, and in the Dakotas next year than ever before. The farmers find now it pays them better to raise live stock and root crops, and the soil and climate in our part of the country are as favorable for those crops as for wheat. In Southern Minnesota there are large herds of cattle now, and many of the present great wheat centers will be turned into live stock districts in a year or two. This change is due, of course, largely to the prevailing low prices of wheat, but also to the knowledge that other great wheat districts are coming in. Take Manitoba and your great North-West, for instance. Nobody likes to estimate the vast amount of wheat they can produce."

A flour packer does not improve the quality of the flour in anyway but it is one of the handiest and most useful machines in a flour mill, and saves the price of a man, and in that way makes money for the mill.

A CHAPTER ON FRICTION.

FRICTION is not a force in mechanics, it is a resistance; a passive resistance to motion, writes F. J. Moster, in the Wood Worker. It is the tendency of force to produce motion, whereas the tendency of friction is to destroy motion. Nor is the increase of friction between two surfaces in contact properly the amount of force necessary to produce motion, but the amount of pressure necessary to balance the friction and bring the body to a state of indifference to both rest and motion. Yet we use friction to transmit force, and it is sometimes convenient to speak of it as the force itself.

All surfaces, however highly polished, contain minute projections, hence when pressed together the asperities of the two surfaces become to some extent interlocked with each other and produce resistance to motion—and this is friction. The whole amount of friction stated in pounds of resistance, is the product of two factors. The first of these factors is called the co-efficient of friction. Co-efficient, as an adjective, means operating together; as a noun it implies co-operation—a factor in multiplication. The co-efficient of friction is a constant number which has been determined by experimenting with substances of different kinds and with surfaces in various conditions. Scientific men have made these experiments and tabulated the results of their experiments, so that now, when the practical mechanic has to solve a problem in friction, he refers to one of these tables for the co-efficient to meet the case. Oak against oak has a co-efficient varying from .975 to .064, according to exposure of grain and quantity and quality of lubrication. Iron against iron has a variation in like manner from .314 to .064. Between these two extremes in the use of iron I find six other co-efficients, so that adding the eight together the average is .148. This is for sliding surfaces; a revolving shaft requires a different co-efficient.

I want to be sure that I make clear the exact use of this co-efficient of friction. I said it was a constant number and so it is for the same conditions. In casting the interest on \$100 at six per cent., we multiply by .06, and that multiplier is the co-efficient in the problem; it is a constant number for that rate of interest. But if we change the rate of interest to five per cent., then we change our multiplier to .05, and that becomes the constant number or co-efficient for all sums of money at that rate of interest. So the co-efficient of friction might be called the rate or amount of friction that prevails with certain surfaces under given conditions of smoothness and lubrication. Then multiplying the total pressure by this rate of friction gives the amount of resistance in pounds—pressure being the same factor in computing the effect of friction.

Mill shafting in these days does not often run on iron surfaces, the boxes being lined with babbitt metal, but I have no table at hand that gives the co-efficient for an iron shaft running on babbitt metal; but on bronze I have. The co-efficient is .251, which will answer our purpose for illustration. Suppose a three inch counter-shaft with two belts each in the same direction, 1,200 pounds each. This will give 2,400 pounds belt tension. Let the weight of the shaft and pulleys be 200 pounds, making 2,600 pounds pressure on the bearings. Inertia and atmospheric influence have nothing to do with the case, I think. Now co-efficient of friction .251, pressure 2,600 pounds, what is the resistance in pounds? 2,600 multiplied by .251 equals 652.6 pounds as the effect of friction. To reduce this to terms of horse power and determine its proportion to the whole of the driving force, we must make further calculation.

Suppose the driven pulley to be two feet in diameter and making 150 revolutions per minute. This will give a belt velocity of 942 feet per minute. Then, 942 multiplied by 1,200 (driving force) equal 1,130,400 divided by 33,000 equals 34-horse power and an insignificant fraction as the amount of driving force.

The shaft is only three inches diameter and therefore does not move with the velocity of the belt on the pulley. The surface of the shaft moves only 118 feet per minute, hence we have 652.6 pressure multiplied by 118 feet equals 77,006.8, divided by 33,000 equals 2.335-horse power as the effect of friction. This is the theory of friction with all things perfect, but it is quite likely that in practice (fair practice, too) the friction would amount to one-eighth of the driving force.

COOPERAGE D'P'T.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each in close touch with the other and to materially advance the interests of both trades.

GENERAL MARKET SURVEY.

THE cooperage market has improved considerably. On the 28th of August the new American Tariff Bill came into force on which staves go on the free list and the duty on hoops and heading is reduced 10%. While, this still practically excludes hoops and heading from the United States market, on prices which are at present in force there, still at times it will enable Canadian hoops and heading to go into the United States. Owing to the duty going off staves, the prices have advanced a little here but the effect has not yet been felt to any great extent on the other side, as there are very small stocks of staves on hand in the United States and manufacturers consequently take the advantage of rebate of duty here and do not give it to the American consumers.

The Canadian producer will get the benefit this year of the rebate of duty, and it will go in their pockets instead of the pockets of the American consumer.

The flour trade is very quiet all over Canada, and with the exception of a few of the largest mills, most of the flour is going into sacks and bags. A great many of the largest mills are running strictly on barrels, both for flour and corn meal, and they all anticipate a good run for the balance of this season.

The following are the present prices for flour and apple barrel stock F.O.B. cars Toronto.

		Per net 1,000
No. 1, 28½ or 30" jointed elm staves.....	\$5 80	
No. 2, 28½ or 30" " " " ".....	\$3 55	
M. R., 28½ or 30" " " " ".....	\$5 45	
No. 1, 24" jointed elm staves.....	\$4 60	
No. 1, 5½ ft. patent coiled hoops.....	\$6 00	
No. 1, 6 ft. " " " ".....	\$6 35	
No. 1, 6½ ft. " " " ".....	\$6 60	
		Per set
No. 1, 17½" kiln dried basswood heading.....	4½c.	
No. 2, 17½" " " " ".....	3½c.	
M. R., 17½" " " " ".....	3¾c.	

AMERICAN MARKETS.

THE probable effect of the new tariff on the price of staves is open to various interpretations in United States markets. The Northwestern Miller, of Minneapolis, says: "As far as is known, Canadian dealers are holding for \$6.50 per M. for No. 1, especially on future contracts. That the tariff question will make any material difference in prices has not fully developed. The opinion now seems to prevail that the new tariff law will be interpreted as making Canadian staves free. There are still more or less elm staves reported offered from Michigan and other domestic manufacturers, for prompt shipment, at prices all the way from \$6.15 to \$6.50. These staves are regarded as of varying quality, ranging from very poor to fairly good. Heading is not changed in position. While 3½c per set is the recognized market price, it is stated that some parties are so reckless as to be willing to sell for less." The Lumberman of the same place, remarks: "The association price for heading has been forced down. At the last meeting of the association, some months ago, the association price was lowered from 4¼ cents per set to 4 cents and it was hoped that it could be held there until there was a sufficient demand to return it to the old figure. The stocks of manufacturers outside of the association, were supposed to be small, and it was expected that they would be exhausted in a short time so that the association could control the market. These stocks, however, held out right along and the owners were continually cutting into the market with goods offered at a lower price. The association held on for a long time, but finally it was decided that there was no further use to make the effort and continue losing trade, and so the association price has been reduced to a minimum limit of 3½ cents per set. At this figure the heading is sold at below cost but this low limit was placed in order that the members should be at liberty to compete with those outside of the association. Minneapolis coopers are not very well pleased at this turn of affairs, as most of them have already contracted for some time ahead at 4 cents, and to

see the market drop a whole half cent below their contracts, gives them the idea that they are not as well off as they might be. Elm staves are still at the same figure, though the change in the tariff is expected to be felt before long, when there will very likely be a drop. The Canadian manufacturer who has heretofore had to compete with the manufacturers on this side of the line, as well as the tariff of 43½ cents per M, will be in a position to make a lower price than has been quoted, and the native manufacturer, in order to hold his trade will have to make a like move. Prices are already weakening, and it is reported that Ohio and Michigan staves can now be secured at prices varying from \$6.25 to \$6.50 per M."

THE MANUFACTURE OF BARRELS.

IN the several articles on cooperage that have appeared in these pages for some months, the writer Mr. B. F. Pratt, of the Wood Worker, has been dealing largely with the question of stave making and the labor back of that in securing the raw material from the forests. He now brings us up to that point in the trade where he deals more directly with the manufacture of the barrel itself. Mr. Pratt says: I have tried to reach a point when I could introduce the reader to manufacturing barrels, but through the details of such a thing as stave making and other things relative thereto, we have only now reached it by the strides made in this direction.

Commencing in the woods, originally this form of barrel making was but little thought of, as skilled workmen could only be found in large cities; but in order to work up the waste of stave yards, coopers have been induced to go to the country for the class of work we use in packing houses only—which is made by the hand cooper; pickle work is made of the same material, but usually the staves are shipped to market for pickle-barrel coopers. That, however, is done more extensively by machinery. We will first take the original way of making barrels and come to the progressive way later on.

The hand cooper in a good timber region can start a cooper shop if he has a suitable building for one or two men to work in—any kind of an old log house or wooden structure, with windows for light and a large chimney for firing barrels—providing he has tools, with an investment of \$25, by buying rough or sawed oil-barrel staves or heading to work. Of course, he depends on selling his barrels every week to a dealer. One man, who is a rapid workman, can usually make twenty tierces, often twenty-five, per week, of stock like split staves, and make his own heads. Coopers find it profitable, usually, when they can get heading ready made, to buy it; but in the woods our country cooper takes split heading, and with a broad axe hews off the surplus weight from the smooth side of the head or the side he intends for the outside, then sits down to a shaving horse and with a heading knife (a long drawing knife) he smooths his heading up for the jointer. With a hand-jointer with a concave face, he makes a joint that is dished slightly; then with a hand-doweling machine he bores holes for the dowel-pins, which are also made by hand, with a form which is simply a hole in a piece of iron or steel, three-eighths or five-sixteenths in size, through which pieces of tough dry oak or hickory are driven to make pins the right size and kind. Now the pieces of heading are doweled together, first putting in strips of flag between each joint, and the head is in shape to get the circumference so as to turn it down to fit the barrel. Coopers make heading for a day's work usually in the morning, leaving it square until their barrel is set up. They use a "float" to smooth the rough, outside places, especially in working sawed heading, as this is by far the easiest to work.

Now for the preparation of the staves and hoops: This must be done in order to make three or four barrels a day, which is a good day's work. Split staves are treated the same as heading; often the froe is used to hew and split off the surplus and defective wood; then with a backing knife the stave is backed perfectly. Then a knife the shape of the hollow is used to hollow it out; each edge is listed and the stave is ready for the hand jointer. This is a plane longer than a heading jointer and faced convex, so if the bit is set correctly, when the stave fills the shape of the plane it is slightly convexed, so when the two edges are set together the stave will only be touching in one place, or, as coopers term it, rolling from the end of the stave to the center or

bilge. How much this is done depends on the width of staves. A man with a mechanical eye always knows by the run of the width of his staves how much joint to put on.

Staves from oil barrel culls usually run eighteen or nineteen to the barrel. If sound knots are in the stave that will come under the hoops they often put in wide staves of this character and thus get out a barrel of average appearance. If a good mechanic sets it up this is done by taking a lard tierce set of tress hoops, with twenty-one inch head hoop (the hoops are made so the bilge or largest of the set will slip over the head hoop), and the set of staves is held against the body and the head hoop is made to take in the set of staves, which, after being jointed, the set can be fitted by taking out one that is too narrow and inserting a wider stave until the hoops are full, a bilge hoop being driven down to the center or so near it the cooper finds his joint and everything is all right. He leaves the bilge hoop to hold the barrel in shape and knocks his head hoop off, putting on the quarter hoop. Now he puts on the head hoop again, and driving his hoops on tight with an adze or hammer, sets his barrel on a cresset, a slow wood fire being prepared of the chips and waste from staves and heading, and barrel No. 1 is set on to fire. If he has tress hoops to get another barrel ready to fire, he does this while the first barrel is firing; if not, he splits his poles and shaves his hoops while the barrel is getting hot, after which he takes it off and, with a hand windlass consisting of a rope sufficiently stout and long to go to the end that is not in tress hoops, his wooden windlass is set to work and this end is brought to a close and the end tress hoop driven on while it is in the windlass; then the bilge hoop goes on and the quarter hoop, and the barrel is put on the fire for at least ten minutes and made perfectly hot. Care must be taken to not char or blacken the inside of the package. There must be one level place in a cooper shop and now is the time to find it. The tress hoops are driven in their places and the barrel leveled up. A knife known as a chamfering knife is used to make the chamfer or bevel; a leveling plane to level it off; then a howel to howel out the surplus wood; then a croze is cut with a lance. All of these tools are specially made for the business, and each set is made to suit the size of the package they are to work on.

The only mechanical work now left to do is putting in the head. This is done by the use of a compress. The barrel is stepped around for times with a compass, and if the point comes exactly or a little scant of sticking the starting point, you have the center of the head and the head is then circled and made to fit. The barrel has got cold and the head is made perfectly tight by flagging the stave joints all around the head. Hoops, having been set up beside the chimney, are now hot. Measuring from the center of the head to the outside of the barrel, we have the distance it requires hooping, or one-third is the space necessary to be covered on each end. The locks to each hoop are cut by measuring around the barrel. The hoop is tried. If too long, the "dutchman," a small piece of wood cut triangularly, is fitted in and the hoop driven to its place. This is done until about eight hoops are made to cover each end, and the barrel or tierce is fully two-thirds covered with hoops—"a standard package." This must be thirty-three inches long and twenty-one inches in the head.

Some packers want all hickory hoops, some end and bilge hoops hickory and the balance oak, and others say all oak is good enough so they are not too high in price. So it is. Oak is the best if exposed to too much water, but for all kinds of service one is about as good as the other. "Olio" packages are made exactly like a tierce except the steel hoops used on them, which are the same as the beef tierces of 1860 and 1870, except the beef tierce was made free from sap.

Pork barrels and half barrels are made exactly as the tierce, only requiring special tools for the work. Lard kegs are a thing of the past. They were made in like manner, but are not likely to ever come into use again. Pickle barrels are made, when wood-bound, free from objectionable sap, and quarter-bound only, having fourteen hoops, and are all, like the cider barrel, made in seventeen and one-half-inch tress-hoops. They are not likely to soon be changed from the old style.

FLOUR MILL FIRES.

By J. C. BOWERS, in "MILLING."

THE rapid increase in the number and magnitude of fires in past years seems to many people who have given but little attention to the subject to be a mystery. This subtle element, so useful to mankind when confined within the limits of safety, now so often bursts those bounds that we may reasonably suppose there is never a moment when there is not somewhere, more or less destruction in its ravages. Ever somewhere may be seen the cloud of smoke by day, or the crimsoning sky by night, telling of distress and disaster from this prolific source of evil.

A comparatively large portion of these fires may be traced directly to flouring mills. In no building used for manufacturing purposes, is the danger of fire more apparent than in that of the flouring mill. The rapid spread of fire from floor to floor, often directly from basement to attic, is many times due to faulty construction, especially of the interior, for where great pains and expense are expended on solid and comparatively indestructible outside walls, the interior construction is likely to be decidedly unsafe. Every mill, as a matter of course, is composed of material which is of a highly inflammable character. There is a network of spouts, elevators, posts, floor beams, belting, etc., all of which are so closely interwoven that in many places the light is almost entirely shut out. The elevator legs form a large number of wooden flues, which constitute excellent concealed passages for smoke and flames. By means of these hidden flues a fire has a chance to spread unobserved with astounding celerity, at the same time, most difficult to reach the flames with water.

Brick or stone buildings, as usually constructed, are no better nor safer than frame structures. It is true, stone and brick walls afford protection against flames from the outside, but they form merely the outer shell. The walls are often so thoroughly protected that there is but little chance to act upon a fire from without and the building forms a roaring furnace which no one dares to enter, in fact those who chance to be within often barely escape with their lives when the fire has made itself apparent to them.

Another great inducement for a fire to spread upward and in all directions is the open stairway. There is every opportunity for fire to play "hide-and-go-seek" from cellar to attic in spite of the shrieks of the watchman and neighbors, and the yells of the populace, or the earnest, hard work of the fire department, when they arrive too late to be of any service. When we read: "The elegant mill of ——— took fire last night, and in spite of the most heroic efforts of the firemen was totally destroyed. Every effort was made, by those who first saw the fire, to extinguish it, but it had burned its way into the stairway (or hatchway) where it could not be reached, and the smoke soon drove those who were so earnestly engaged out of the mill. The loss could not be less than anywhere from \$10,000 to \$100,000. We most sincerely sympathize, etc." But not one word of wisdom or caution as to the manner of building, or procuring means to prevent the destruction of another when by carelessness or accident it once takes fire.

The secret of fireproof building is this: It must be made impossible for the flames to pass through the floors or up the stairway. This, of course, is rather difficult to accomplish in the construction of a flouring mill. An effort should be made, at least, to avoid the danger as much as possible. The following suggestions might be offered: Lay a flooring of the thinnest sheet iron over the joists, and the wood flooring upon that, and sheathe the stairs with the same material. A floor will not burn without a supply of air under it. Throw a dry board you upon a perfectly flat pavement and kindle it as it lies if can. You may make a fire upon it and in time consume it, but it will require a long time. By using thin iron it could be easily cut with cold chisels and shears for spout holes and the edges turned up. A short section of spout made of sheet iron could be made use of above floor. A drop valve made of sheet iron could be applied to guard against fire entering a spout from below. These sections of spouts would add very little to the cost. They could be made quite cheap by any tinner or sheet iron worker and cut to the proper bevel by the millwright.

A difficult task would be to prevent fire from going up

the elevator legs. The draught, however, could be checked, in a measure, by the application of brushes, the frame of which to be lined with iron. They would serve the purpose of dampers to check draught as well as to be of service as a brush. They could be applied to each elevator at intervals of ten feet apart. The stairway should be enclosed with fire brick walls or at least a wooden partition lined with iron. The main upright belts should be enclosed. As few belts as possible, however, should be used from one floor to another. Prevent draughts and, though there will still be fires, the chances are that discovery is certain in time to prevent any great calamity.

An item which helps to fill the newspapers, therefore, is somewhat as follows: "Destructive fire. The mill of ——— was found on fire last night by persons passing on the street. There seemed to be but little fire and that in the basement. It soon, however, reached from one floor on to the next and although the fire department was on hand as usual, yet before they got to work the flames had found their way through the roof and contents were all ablaze. The department succeeded in confining the fire to the ———." This would be varied, not exactly according to the weather, but of the wind. Why, then are not the mills provided with safety stairs or hatchways, which can never be open except when in use? Why are not stairways enclosed with fireproof material and the doors made fireproof and self-adjusting? Because it is not the law, with a severe penalty, that they should be placed in every mill, warehouses, etc. That is the simplest reason. It cost something.

When fire catches at the bottom it rushes up the narrow space, roaring like a chimney on fire, and in a moment or two, often before an alarm can be sounded, the great building is on fire in every story. Before a fire extinguisher can be got to work the fire has enveloped the building and become so intense that even the extinguisher can be of little other use than to confine the fire to the mill itself. If the fire can be kept in one story the first engine would have made short work of it. For want of that it was in every story before it got to work at it.

A certain mill may be found to be on fire in the third or fourth story, having caught in the basement, and at first seen up there, though it was at work in all the lower stories. There is not the smallest chance to put out such a fire from destroying other buildings.

A great many such fires are seen when so small that with the same coolness and presence of mind with which we attend to other affairs, and with proper implements for extinguishing them, such as are provided for our other work, would be put out in a few minutes, and with so little loss as to hardly be worth telling of to the neighbors. It is indeed an exceptional fire that could not have been extinguished in its earlier stages, if the means at hand had been used with intelligence and energy. As in every other crisis of life, organization is superior to random effort. The thinking must be done beforehand. It is bad generalship to form the plan of battle in the presence of the enemy.

In the construction of a flouring mill the most effective means of retarding the spread of fire should be employed, the aim being that the limits of destruction shall be reduced to a minimum by making mills slow-burning rather than striving to make them fireproof. A fireproof factory building is considered a commercial impossibility—how then about a fireproof mill?

CLEANING WHEAT IN THE MILLS OF SCOTLAND.

M. R. W. G. ANDERSON, manager of the Dundee Flour Mills, recently delivered a lecture in Dundee on "Wheat, Flour Manufacture, and Bread." After describing the methods of storing the grain, he passed on to explain the process of wheat cleaning. In Scotland what was looked upon as a full and complete wheat cleaning system was not required, for the simple reason that only the best, and therefore the cleanest, wheat could be used to make that high quality of flour demanded by Scotch people. Most of the Indian, and many sorts of Russian and La Plata wheats, were so dirty that nothing short of what their Yankee cousins called "the laundry system"—a thorough washing and drying—was absolutely necessary to put them in

proper condition for flour making. Indian wheat especially was so dirty that in some years the import of dirt into the United Kingdom has been estimated at over 3,000,000 hundred weight, the whole of which, with the exception, perhaps, of a very infinitesimal proportion, found its way into English ports. It was, however, surprising to note the quantity of refuse that came from even the finest, cleanest looking wheats. The removal of all impurities and foreign matter before sending the wheat into the mill to be ground, was one of the most important duties. If these impurities were not entirely removed before milling, their presence for evil was felt to a greater or less extent throughout the whole mill. It might happen that an ordinary quality of wheat well cleaned would yield a flour as good as, if not superior to, that made from a finer quality carelessly cleaned.

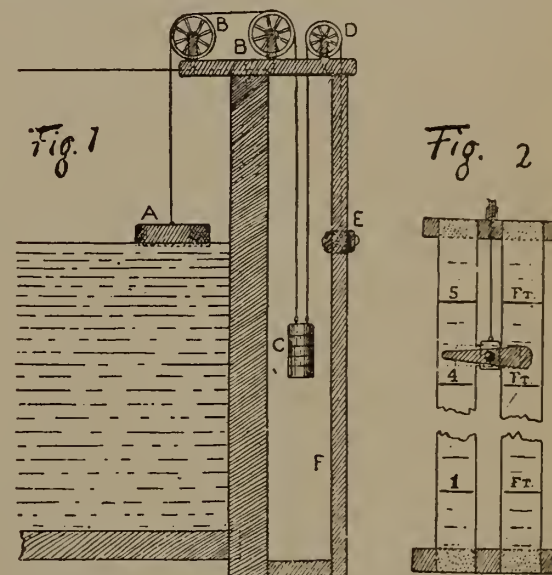
The outstanding principle involved in the machines used in the cleaning house was separation. This was effected by the use of machines based on the principle of separation by difference in weight and size, by difference in structure or shape, by friction, and by magnetism.

AN INDICATOR FOR WATER TANKS.

A CORRESPONDENT of the *Sawmill Gazette* gives the following description of an indicator he put on a water tank and found to work perfectly:

The ordinary indicators used on tanks have the figures reversed, that is to say, the indicator goes down as the water in the tank goes up. With this indicator, although simple in construction, the finger always remained precisely at the level of the water.

In Fig. 1, which is a sectional view of the tank and indicator, the usual float is represented at A. It can be made of tin or wood, as necessity or convenience dictates. From the float a stout cord or piece of pliable wire runs over the small pulleys B B to the weight C. From the weight another smaller cord runs back up and over pulley D to the indicator E. It is plain that when



AN INDICATOR FOR WATER TANKS.

the float goes up the weight will descend, and when the weight goes down the indicator will ascend. When the three are properly adjusted the indicator will constantly remain at the level of the water. Care must be taken with regard to the weights of the float, indicator, etc. The weight of the float and indicator must be sufficient to overcome friction and fall readily and also sufficient to overbalance the weight C, so that when the water falls the combined weight of float and indicator will lift it. On the other hand C must be heavier than E, so that when the water floats A the weight will immediately pull the wires tight and maintain the correct position of the indicator.

In Fig. 2 the front of the indicator is shown. Two narrow boards are fastened so that a slot is left between them in which the indicator block may slide. The block should fit loosely in the slot and have the finger and a piece on the back, shown by dotted lines, bolted to it. In constructing the indicator plenty of space should be left between the tank and the boards F to permit the weight to rise freely. If the wind blows the weight about, the space which it occupies should be boxed in.



Office of the CANADIAN MILLER,
September 10, 1894.]

THE GENERAL SURVEY.

HOW will the present crop compare with that of a year ago is a question that is being actively discussed at the present time. Harvesting is well enough advanced to enable one to look into the question with more certainty of arriving at actual results than even a month ago.

The Vienna report of the world's wheat crop for 1894 has been issued. Whilst in some quarters this report is viewed with authority, yet there has been good reason to discredit some statements made in former years. The method adopted in giving the yield of European countries for 1894 is by percentages with 100, as the standard for 1893, making comparisons as follows :

	Wheat.	Rye.	Barley.	Oats.
Austria.....	100	95	98	96
Hungary.....	99	96	94	98
Germany.....	107	95	107	105
France.....	120	125	100	115
Great Britain.....	17	110	110	105
Russia.....	82	97	97	86
Moldavia.....	87	90	90	90
Wallachia.....	67	40	40	40
Netherlands.....	87	97	92	112
Belgium.....	102	107	100	102
Switzerland.....	100	110	...	100
Denmark.....	105	95	100	100
Sweden and Norway.....	95	92	102	102

The yield of the United States is placed at 390,000,000 bushels of wheat against 382,000,000 last year. It is well known, however, that these figures, as giving the crop in the States a year ago, are wide of the mark, and in this particular reflects unfavorably on the Vienna report.

Taking our information from another source, namely, the calculations made by the London Economist, it is stated that the crop in the United Kingdom will be bountiful, though the acreage will show a diminution over a year ago. The total yield is placed at 6,000,000 bushels greater than last year. Spain, Portugal, Italy, Germany, Holland and Belgium all show an increase over a year ago. Austria-Hungary and probably Russia do not show up as favorably. The crop in the United States is placed at something between 400,000,000 and 475,000,000 bushels, which is likely to be nearer the mark than the Vienna report. The conclusions of the London Economist are summed up in these words : "Both Europe and America will probably produce less than the quantities grown in 1894; but unless other parts of the world fall off greatly the total production can hardly fall below a year's consumption, while there are still remnants of the great accumulations of the last three years to clear off, so that there is nothing at present to indicate any substantial improvement in the price of wheat."

In our country the prospects are favorable. Ontario's crop has been placed at about the same figure as last year. It may be, however, that the intensely dry spell of the past two months will have affected the quality of the grain when it comes to be threshed. It looks as though Manitoba would be favored with a crop averaging an increase over some other years. The yield per acre in many quarters is turning out better than was shown by reports of a month ago. The government bulletin for August estimates the yield as follows : Wheat, 17,761,868 bushels, and the average for the province 15.6 bushels per acre. Oats, 12,197,772 bushels; barley, 2,182,520 bushels; peas, 20,000 bushels; flax, 282,480 bushels; rye, 53,074 bushels. The gross total is 30,497,714 bushels.

These figures are improved upon by conditions since the August report was issued. The condition of the weather, with heavy dews and cold nights, has caused the wheat to fill out well in the face of the unusually dry spell. In some parts of the Assiniboia district it is not

supposed that the crops will figure out as well as in Manitoba.

When we get away from a study of these figures, and conclusions as to results in the future will vary according as the individual makes his calculations even from the same data, and faces the situation just as it meets us today, there is still very little of a hopeful outlook for wheat.

Senator Wasburn, of Minneapolis, the great flour miller, when in Montreal a few days ago, reiterated the opinion that has been several times given on good authority, that it is hardly possible for prices to go any lower, because "wheat is really worth more," but as the Montreal Trade Bulletin very plainly says in an article, which we reprint elsewhere, to rest on the supposition that wheat or any other commodity cannot get below what it costs to produce it, is a broken reed to rest on. The facts are that the price of wheat keeps down, and when we consider the size of the new crop, take whatever estimate one may, and remember that in public and private store houses in Canada and the United States there are still immense quantities of old wheat, it does not seem as though there were any circumstances shaping to cause wheat to go up permanently in price.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—New winter wheat has been offering at about 52c. west. The purchases by the millers at the price are small. Manitoba No. 1 hard west, offers at 68c. and east at 70c. Montreal : No. 2 Manitoba hard, 66c. to 68c. Chicago : No. 3 spring wheat, nominal; No. 2 red, 58c. Duluth : No. 1 hard, 61½c. for Sept.; No. 1 northern, 55c. for Sept.; No. 1 northern, 56c. for Dec.; No. 1 northern, 60½c. for May. Toledo: No. 2 cash and Sept. 53½c.; Oct. 54½c.; Dec. 56½c.; May 61½c.

BARLEY—Toronto—An unsettled market. Feed sold outside at 38c. to 40c. In United States markets there is a fair enquiry for barley and prices are gradually creeping up under the influence of a strong market in the West. No Western is offered at Buffalo below 55c. and from that up to 60c. Canada, although nothing has been done, is being figured on to considerable extent. The range is placed at from 60c. to 65c. in Buffalo.

OATS—Toronto—White oats for milling have been sold west within the week at 29½c. Mixed in demand at 25c. White quoted at 26c. to 27c.

PEAS—Toronto—No very large call, but feeling steady. Car lots of choice new peas are being taken for export; middle freights west, at 56.

THE FLOUR MARKET.

The flour market remains practically where it stood a month ago. Millers are yet buying slowly of new wheat and the disposition is to wait a little and see how conditions shape. Export markets do not improve to give any new encouragement in that direction. The demand for mill feed is firm and active. In the course of another month the trade will be able to speak in a more definite manner as to the prospects for fall trade.

PRICES OF FLOUR AND MEALS.

TORONTO—flour : Toronto freights. Manitoba patents, \$3.40 to \$3.60; Manitoba strong bakers, \$3.30 to \$3.40; Ontario patents, \$2.90 to \$3.00; straight rollers, \$2.50 to \$2.70; extras, \$2.50 to \$2.60; low grades per bag, 85c. Brans, \$13 to \$13.50. Shorts, \$16.50 to \$17.00.

MONTREAL—Patent winter, \$3.30 to \$3.40; patent spring, \$3.40 to \$3.50; straight rollers, \$3.70 to \$3.90; extra, \$2.40 to \$2.60; superfine, \$2.30 to \$2.40; strong bakers, \$3.25 to \$3.40; Ontario bags, \$1.30 to \$1.40.

RUSSIA'S FLOUR TRADE.

SAYS the London, England, Milling and Market News: There were in operation in 1893 along the basin of the Volga 189 flour mills, and the flour produced amounted to 7,369,000 sacks of 280 pounds. When considering the rapid development of flour-milling in Russia, it may surprise some of our readers to know that last year the exports of Russian flour were represented by 385,700 sacks, and of rye meal by 565,500 sacks of 280 pounds, in comparison with 332,600 sacks of the former and 526,000 sacks of the latter in 1892.

SELECTING WHEAT FOR THE MILL.

BEING able to intelligently and properly select wheat for the mill is a matter of both knowledge and experience. The proper person to make the selection is the one who knows about what kind and what quantity of flour it will make, as different varieties of wheat differ very materially in this respect.

One kind of wheat has heavier and more bran in it than another, and hence does not yield so well. Then again some kinds will make whiter flour than others, and all grow in the same neighborhood. Occasionally, too, the same varieties vary some in this respect just as the soil varies in chemical combination.

There are still other conditions of an artificial nature that have to be taken into consideration and are best judged by men of experience. Wheat that has been badly taken care of by the producers and allowed to get damp and musty, or if only tinted in that way is not so valuable as sound and sweet wheat. Unless quite damp and otherwise badly damaged it may not be detected by the inexperienced buyer and the mill get a supply of inferior wheat.

As a rule, in mills of ordinary size the owner or whoever may have charge of the office has the wheat buying and very often such men have but little knowledge of it, none, as a rule, but what is acquired by practice, and that is all right provided the practice has been long enough, but the misfortune is that many of them jump into the buyer's position without practice or experience of any kind and go it blind, to the injury of the business.

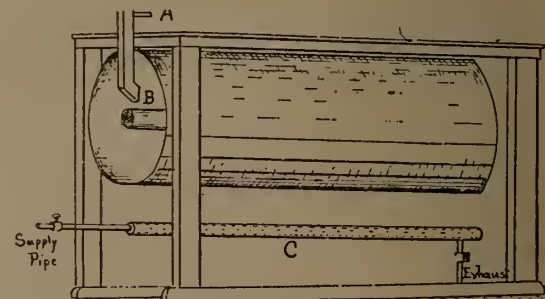
The miller, if he is a miller, is in reality the proper person to select the wheat for the mill. Selecting in this case is scarcely the proper term, because most mills, in the country especially, that depend on farmer's deliveries, are obliged to take everything that is offered if not too badly damaged. But what is here meant is that selections should be made in reference to relative value for flour making purposes and the different kinds of wheat distributed accordingly into different bins, where they can readily be made available for the kind of work they are best suited for, and of that the miller is the only judge.

To save disputes with the farmers, the millers as a rule pay the same price for all kinds of sound wheat that weigh about the same, notwithstanding there may be considerable difference in real value. But even though that is done the miller should still do the selecting to the extent of assigning each kind to its proper place in the warehouse.

Millers should always refuse to accept badly damaged and unsound wheat, as it is not fit to make flour with and by mixing it with good stock they so damage flour as to cause them primary loss as well as loss of reputation.—The Tradesman.

A HOME-MADE WHEAT STEAMER.

THE wheat steamer, here illustrated, is a design furnished by C. E. Lees for the American Miller, and can be made at a small cost by any miller or millwright, and will prove very satisfactory. The slide at A is to regulate the amount of wheat going to the reel. At B is a



A HOME-MADE WHEAT STEAMER.

swinging door which prevents the steam from going up the wheat spout, and at C is a perforated pipe supplied with steam by the steam supply pipe.

In steaming with this appliance the wheat enters a short reel about four feet long, clothed with coarse wire or perforated metal. Directly under the reel is the perforated steam pipe. The steam in rising passes through the cloth, and as the reel revolves it steams every grain as thoroughly as desired.

VIEWS AND INTERVIEWS.

Flour and Grain
Prices.

The average export price of wheat from the United States for the year ending June 30, says Price Current, was 67.2 cents per bushel, compared with 79.9 for the preceding year, and an annual average of 90 cents for a period of ten years ending with 1893. The average price of flour exported for the year was \$4.11 per barrel, compared with \$4.54 the preceding year, and an annual average of \$4.81 for ten years ending with 1893. The decline in valuation of flour being less than in wheat, is suggestive of the view that the exports embrace a higher average in quality compared with the previous years.

Testing
Flour.

Just what ground should be covered in testing flour is a moot question with millers and bakers. A writer in the *Helper*, however, says that for all practical purposes it is only necessary in testing flours to find color, water-strength and gluten. Although the natural moisture in the samples under examination may vary from ten to fourteen per cent., yet this makes no difference in the end, if the other points are known. For instance, take two flours alike in general respects, but one having fourteen per cent. of moisture and absorbing sixty-five per cent of water to make a dough, and the other having ten per cent. of moisture and absorbing only fifty per cent. of water to make a dough; it follows that the former is the cheaper flour notwithstanding the fact that it has more moisture. Hence, the determination of moisture in a sample of flour is only valuable in an educative sense. If the purchase of grain for horse feed were under consideration then it would be profitable to weigh a hundred grains of each sample offered and dry them till they lost no more weight, then weigh again; the difference is water evaporated; and the sample having the greatest weight when dried, is the cheapest to buy, other conditions being equal. Remarks as to moisture also apply to the soluble extract of flour. This is found by mixing a known weight of flour and measure of water together in a bottle and allowing the flour to settle; then decanting off a certain measure of the clear liquid and evaporating to dryness. As a general rule, the finding of the weight and character of the gluten will fairly determine whether there is present a dangerous amount of the soluble extract.

The Trade
Journal.

The following from a British journal in the printing trade, is well worth reading by tradesmen in all lines:—
“From being a mere advertising sheet, representing only special individual interests, the trade journal has become the great organ of communication between manufacturers and dealers and their customers, and has helped and is helping to bring them into closer relations with one another. It has become one of the best educators, and, since the general abrogation of trade mysteries—better known as secrets of the trade—it has done a good work in the spread of technical knowledge among all classes, to the benefit of the entire community. So well has this become recognized that a man is regarded as behind the times who does not take and read at least one journal devoted to his trade or profession. There are many who may say—and some who actually believe—that they cannot afford to take a trade paper, when the truth is they cannot afford to do without one. If a man is content to follow in one beaten path all his life; if he is so wise in his own conceit that he thinks he knows it all, and that nobody can teach him anything; if he is content to remain in sodden ignorance because he cannot see that the knowledge offered him is going to bring him an immediate return in cash—then, in all such cases, a man cannot afford to pay for a trade journal. But if he would keep abreast of the times in his own calling; if he would know what new inventions and discoveries are being made that directly affect his own interests; if he would profit by the experience of others as told in print; if he would know everything possible connected with his own calling, so that he may be able to converse intelligently, not only with his co-workers, but with outsiders seeking information—then the trade journal is indispensable. It is a power in the land, and

he who rejects its friendly aid will soon find himself at the rear end of the procession. He cannot know too much of his own calling.”

Feeding Flour
to Stock.

Wherever we turn the question of feeding flour to stock is being widely discussed. Experimental stations are making the matter one of investigation. Millers are talking it; farmers are talking it; the grain man is thinking about it. It is a live subject in Canada, as also in the country to the south of us. A milling firm in Winona, Minn., write at some length on the subject in a late issue of the *Northwestern Miller*. They say: “It seems to us that millers should join hands in circulating the results obtained by state experimental stations, in the use of millfeed and low grade flour for feeding stock. This is one thing, at least, on which all millers can unite without arousing the jealousies and antagonisms of the past, and which will largely solve the problem of over-production and lack of milling profit. If the miller could run into one bin all below a patent (or a choice bakers’) and have a demand at home for such a feed, his cares and lamentations would be greatly reduced. There would be no difficulty in grinding practically all the wheat grown in this country, if the farmers would use such a feed for their stock, in place of corn, oats, etc., for we would have only patent flour to export, which we could easily afford to sell in competition with the world. All millers should do their utmost to induce farmers to stop feeding wheat entire, as being an extravagant method of using wheat, and, instead, advocate their buying the less valuable part of wheat, i. e., all below a patent flour, as being fully as valuable for feeding as wheat entire, or ground without the patent being saved. The low prices now quoted abroad for bakers’ and low grades are brought about by our forcing on the markets far more than their requirements of such flour. Now is the time to work these grades off at home, relieving foreign markets, and opening, for years to come, a new outlet, and one that will consume vast quantities of the product of our mills. There is no reason why millers should not see as profitable milling as in years gone by, but it will be when we export only patent flour, and all below that grade will be consumed at home by our farmers in feeding it to cattle and hogs. There will be no cry of over-production, as our mills will be unable to grind up the wheat grown and now going abroad for foreign millers to reap the profit we should have in grinding. May it come soon—the sooner the better.”

FLOUR: A BRITISH VIEW.

THE *Miller*, of London, Eng. in its flour trade review of the month is concerned over the condition of the wheat and flour market, as is everyone else, and says: Wheat at 20s. per quarter is an event by the side of which other trade occurrences may be regarded as insignificant. That not one sort of wheat alone is down to that price, but that there are at least three competitive sellers thereof is in a different way an even more notable fact. Discussions as to the lowest price at which wheat can be profitably grown are for the time being superseded. Neither by the La Plata or the Mississippi, nor on the broad steppes of Russia, or in the rich alluvial delta of the Punjab can wheat be profitably grown and sold from ships anchored in the Thames for 20s. per qr. Freights may be low, trade charges may be cut down, insurance offices may bid against each other for custom, but put all these charges at the lowest, and still the thing is out of the question. Wheat at 20s., delivered in the port of London, is not an article which has paid the producer his “living wage,” or which, having paid that wage to the producer, has remunerated the middleman, the intermediary between the foreign wheat grower and the English miller. We are, therefore, witnessing a competition such as in the old coaching days was not infrequent. It is no jest, but a veritable occurrence, that the coach fare from Exeter to Plymouth having come down through competition to 5s., one of the rivals ran for nothing, while the others rejoined by taking all recognized customers gratis, and finding them a free dinner en route. The object, of course, was to run rivals off the road, and temporary sacrifices became possible good policy with a view to a permanent assured position for the future. The sooner it is recognized that without formal resolution

Argentina, America, Russia and India have none the less entered upon this last and destructive phase of competition, the better it will be for English farmers, who will scarcely venture to be a fifth in the field. The question of the hour for millers is as to how long the present stage of competition can possibly endure. Is it “the accepted hour” for them to buy and store, so as to profit by the situation, or is the struggle destined to last for a long while, and are present prices rather the beginning of a protracted end than the end itself?

A MONTREAL GRIEVANCE.

THE following letter is published in a late issue of the *Montreal Trade Bulletin* over the signature of “A Victim”:

Your last issue has a very good article on this subject, and your remarks as to why this trade is going past Montreal should be taken up in earnest by our Board of Trade and Corn Exchange, and a little of the energy which they give to Civic Finances might very profitably be expended on this point.

The want of official inspection has so often been ventilated in your columns, and the loss of trade is suffering has been so clearly proved that it is needless to go over it again.

But the following is a positive fact, and will serve to reiterate the need of inspection if Canadian flour is not to be taken as a word of condemnation.

Two cars of a choice Canadian Patent were bought by a firm here and shipped to the Lower Ports. Complaints were received that the flour in barrels was not uniform, and on a very careful examination it was found that choice patent flour was at the top and bottom of the barrel and low grade in the middle.

How it was done, it is hard to say, but there is no doubt about it, that a Canadian miller did it.

Are our shippers to be exposed to these frauds without a chance of its being detected until it is found out by the consumer?

Are we to wait till we get a touch of national humiliation before this matter is taken up?

Echo answers, our Board of Trade and Corn Exchange have got something else to think about.

THE NEW METHOD OF MAKING TUBES.

THE new German method, announced some time since, of making steel tubes by punching the pipes from hot metal, is said to promise success in the manufacture of seamless tubes of moderate lengths; the process consisting simply in placing a bar of steel of square cross section in a matrix of sufficient length, then, without allowing time for the steel to cool, a mandrel having a rounded end is forced lengthwise into the mass. It is stated that in this way tubes nearly eight inches in diameter are produced, the pressure required to operate the mandrel being 180 tons. The end of the heated bar furthest from the mandrel is first made to abut against a strong and heavy slide, and, when the rounded nose of the mandrel has nearly passed through the bar, this slide is moved transversely so as to bring a hole in line with the advancing mandrel, which, continuing to move, punches its way through, the protruding end being then seized by tongs and entirely withdrawn. After the completion of these first operations, the bar, with its perforation, is subjected to a finishing treatment of drawing and redrawing until the required thickness of the shell is reached.

THE FATIGUE OF METALS.

THE metallic parts of machines that are in constant use if they are not fully strong enough for the work required of them, undergo what is known scientifically as fatigue. In metals there is a point in their resistance to pulling, bending or crushing which is known as the elastic limit. Beyond this limit, if continued in use, permanent strain begins. When machines are submitted to this limit of strain if it is not kept up too long, they may be restored to normal condition, just as a muscle is by resting. If the strength and power of a machine is fully equal to the task imposed upon it, it does not undergo this fatigue and the use of it may be kept up continuously until impaired by friction. The resemblance in this particular to the muscles of man and other animals is very striking.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, brose meal, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

TARIFF CHANGES.

THE changes in the United States tariff will not, it is anticipated, help the milling and grain trades of this country to any remarkable extent, though we observe that some of our milling contemporaries in the States do not like even the little lowering of the duties that have been made on grain and flour. Wheat flour is simply reduced from 25% to 20%. Oatmeal is lowered from 1c. per lb to 15% ad val.; oats and buckwheat from 15c. per bushel to 20% ad val., and barley from 30c. per bushel to 30% ad val. It is apprehended in some quarters that even in flour Canadians will be able through this reduction of 50% to place certain grades at points conveniently located for shipping. We do not ourselves see where there is much development to be looked for in this direction. The oatmeal trades ought to be strengthened by the change, just as they felt the pressure of the increased duties that came with the McKinley act. The greater benefit will come possibly to barley growers. An effort has been made by certain commercial journals in the States to pooh-pooh the necessity for the importation of any quantity of Canadian barley for malting purposes, but the most significant reply to this criticism is the comment of the malsters themselves, who say that they must have Canadian barley and who do not hesitate to affirm that their trade has suffered since the McKinley bill came into force. They now hope to be able to import larger quantities of Canadian grown barley.

PATENT FLOUR MAKING.

IS patent flour making the proper caper? is the question asked by the well-known writer on milling topics, Mr. R. James Abernethy, in a late issue of the Tradesman.

In briefly reviewing the subject, Mr. Abernethy says, it is necessary to go back a little way to examine the rise and progress of the custom in order to more clearly understand the matter.

Middlings flour making had its origin in continental Europe, but then it has never been known as patent flour making, but generally by numbers, according to grade, there being a great many different grades. The true patent flour was first applied in this country and still applied in this country only. The reason why it was first called patent flour has already been explained in these columns.

Looking backward upon the scene from the standpoint now occupied by the milling industry, it is a curious fact that the wheat of which some of the finest and most reputable flours are now made was a quarter of a century ago regarded with distrust by millers in general and the flour made of it commanded no respect in any market and had no standing above second grade. Many of the active population of this country, and among them millers, are not aware of this fact, but it is true nevertheless.

Hard spring wheat was difficult to mill and no miller wanted it, and when milled the flour was not valuable. To-day it is reduced with the greatest ease and the flour is among the most valuable made.

The temporary success of the Hungarian flour makers along with the introduction of the purifier was what caused the change.

The trouble with the old-time millers was they did not understand how to successfully handle middlings; the art had not then been taught; and as hard wheat could not then be ground without a large production of middlings they did not know what to do. Of course they understood grinding middlings, but the result was second-grade flour, more of it than they had any use for; more of it than they, as a rule, could place with profit. The millers of that day ground wheat to make flour and not to make middlings, and when they got hold of wheat that made little flour and much middlings they were in trouble; and that is the reason why what is now known as the great Scotch Fyfe wheat was then in disrepute. It had as good flour making qualities then as now, but the millers did not know how to handle it.

The introduction of the purifier solved the problem. The middlings were run through the purifier and cleaned before being re-ground, and lo! what a change. Compared with any that had ever previously been made of the same wheat the flour was really magnificent, and when taking into consideration its natural strength and superior bread-making qualifications, it took a position in advance of all flours made in the United States and soon commanded a higher price. This in connection with the fact that both wheat and flour were high priced in those days, made the business of patent flour making very profitable, and it at once became the craze in all hard wheat sections and later in the winter wheat sections as well.

For a number of years the conditions remained substantially the same. Profits continued to be good and the business of flour making very profitable, especially in the northwest. Gradually the soft wheat millers dropped into line and in a little while the practice of middlings milling and patent flour making became almost universal in the great flour making districts, and all for a time were making money. All this was then done with burrs. A little later the rolls, as substitutes for burrs, were introduced and middlings making received a new impetus. After that it can be fairly said the practice was pushed to extremes and a desire to make all middlings and no flour seized the millers of the country. But while this could not and cannot be done, the effort to do so has undoubtedly resulted in injury to the industry. Like all new things that are profitable and upon which there is no license or royalty to pay, patent flour making became in time such a large industry and so common as to wear out the novelty of it and in proportion reduce the profits on it. And to make it still worse an era of descending values set in and the very high prices obtained for all kinds of flour when patent flour making was first introduced has continued to fall until at last the lowest point on record has been reached. Flour is now so low in value that even a fair per cent. of profit would require a magnifying glass to find it at the close of the year's business when all other expenses not generally taken account of, when ordinarily figuring profits through the year, are taken out of it. The average aggregate profits are very small indeed.

The chief cause of the misfortune that has overtaken the business, leaving out of the question the present generally bad condition of business affairs, is that the quantity of patent flour has become so very large in proportion to the whole amount made that it is now and for several years been the basis upon which all flour values are fixed. It is the one leading staple commodity, instead of as it first was a luxury, so to speak, a scarce article for which the maker could obtain his own price.

In that respect it assumed the position that its name implied. It possessed the prerogatives of a patented article, not because protected by letters patent, but rather because the demand was far in excess of the supply. Had it been patented and controlled as patented devices generally are it would have remained a profitable business until very recently, at least. As it was, however, every miller had a right to make it, and every miller that could arrange for it did and does make it, and the aim of all that make a business of it was and is to make all that it is possible to make, until, as above stated, it has become the flour of commerce, upon which all value rating is based.

It is an invariable law of trade and commerce that sooner or later fixes profits upon commodities on the basis of the cost of production. Sometimes, of course,

profits are higher and then again lower, depending somewhat on the supply and demand, but in legitimate trade there is always a profit based on the cost of production.

The production of patent flour being so large, it is necessarily expected by commerce as the staple upon which the prices of flour are fixed, in accordance with the above mentioned laws of trade.

If the entire output of the mill was patent or could be made such, or even if 80 per cent. of it was, this way of fixing values would be all right and the flour makers would at all times be assured of a living profit. Unfortunately, however, such is not the case, for while some of the best hard wheat mills are able to make 70 per cent. of patent flour the average, taking both winter and spring wheat, will probably not much exceed 50 per cent. But if we allow it to be 60 per cent., there is still a remainder of 40 per cent. that commercial regulations take no account of. It regulates the price of the patent in accordance with the cost of the raw material of which the flour is made, without reference to the other 40 per cent. which is thus obliged to tail on behind, and have fixed upon it a price in relation to its quality as compared with the patent. And now when prices are very low and aggregate profits are small on the patent flour basis, it follows conclusively that the 40 per cent. uncared for must sell at a price all the way down from actual cost to a loss about equal the profits on the patent, which often leaves the mill with no actual profits and scarcely interest.

This being the fact, and there is scarcely a doubt of it, it requires no sage observer to see that there is something radically wrong with the practice and that some other course ought to be pursued by the millers in order to save themselves from the incubus imposed upon them by the abnormal lengths in patent flour making.

Before patent flour was made the aim of all good millers was to make substantially a straight or as much of a straight as it was possible to make, and on that product values were based. It is true that lower grades of stock had, then as now, to be made into lower grades of flour; but the leading commercial flour was in the order of a straight into which all that was possible was worked and the remaining products that could not be safely worked into the leader had to be worked into lower grades.

Now, then, the question comes up, would it not be better business practice, or a better business policy, to turn backwards a step and at least consider whether or not the millers of those days acted wisely? It may of course be said that they were unable to do any other way, as they did not know how to do differently, nor had they the facilities.

The probability of that will be granted, and for the sake of the argument it will be admitted that they were obliged to mill in that way, would it not now be acting the part of wisdom for our millers to go back and inquire into the merits of that way of doing it, as compared with the present plan?

The writer believes that in that respect the old way was much the best and much the surest money maker, when the results of years are added together. It is not exclusively for fun that flour mills are run, nor are they usually run for the benefit of the health of the owners, but for making money, or at least that is the aim, whether any money is made or not.

The patent flour certainly crushes the life and thereby all the profits out of the lower grades and in so doing leaves nothing for the miller but his feed and not always that. If it does not do that is it not a thing to be hated rather than loved and petted as it now is?

SOUND GOSPEL.

IT is the prompt attention to little things that makes the successful engineer. The careless man is dropped at a convenient moment, and he has hard work to get another "job." The greater dangers are seen by all, and almost anyone can make the proper provisions. The engineer who scents danger, which may result in two or three days' "shut down," or a possible explosion, is the one who gains his employer's confidence and finally lands on top.—Safety-Valve.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

TERMINAL ELEVATOR CHARGES.

To the Editor of the CANADIAN MILLER :

SIR,—The interest that is taken by your journal in matters pertaining to Manitoba and the Northwest ought to be pleasing to all interested in grain and milling affairs in these territories. I am constrained to write to you to-day on the matter of terminal elevator charges, suggested by the fact that the Great Northern Railway Company have recently reduced their elevator rates at Duluth to one-half cent per bushel for receiving, elevating, and discharging, including storage for 15 days, which is only one-half their former rate. Why should this rate exist at all? As one of our local journals here has pointed out, "railway elevators are simply freight or storage warehouses, built by the railways for their own convenience in handling their traffic. They make no charge for handling ordinary freight through their storage houses, and why should they charge for handling wheat, any more than for handling cases of dry-goods and boxes of groceries?" This may possibly be putting the matter just a little too strongly. Grain, as an item of storage, holds a somewhat different position to goods that are packed and are more easily handled than wheat or any other cereal. But it has been apparent for a long time that the charges for this work have been altogether excessive. I should certainly not object if the storage of grain could be placed upon just the same basis as ordinary freight, but it is not expecting too much that our railways, and that speedily, should reduce their rates for the storage and handling of grain. These rates ought to be reduced, if for no other reason, because of the reduction that has taken place in the values of grain during the last year or two. Expenses in other directions are coming down as a result of these changes, and why not elevator charges?

Yours, etc.,

MANITOBAN.

MAKING PROGRESS.

To the Editor of the CANADIAN MILLER :

SIR,—In this western hemisphere we are apt to pride ourselves on the perfect and progressive character of our business methods. We talk of ourselves as a go-ahead people, and it is true that there is a good deal of go-aheaditiveness about us, if that means sometimes a lack of care and conservatism. We are seldom afraid to experiment ; at the same time it is fair to say that this spirit has led us to be in advance in many matters of the older countries. We find an illustration of this kind of thing if we look at the mills of this country as compared with those in certain parts of Europe. We could at one time and that not very long since apply this remark to Great Britain, but John Bull has caught on all right and his flour mills are about as perfect as you find flour mills anywhere. What John Bull has done other countries are doing to-day. Russia is developing her milling system quite rapidly and we are now told that western methods of the elevator system are being adopted in the land of the Czar. The point I want to get at is this, for I do not believe in lengthy letters, is that it is a difficult matter for any people to long hold supremacy of methods of manufacture in milling or any other line of business. And this condition makes it necessary, when we discuss the milling and grain situation, to remember that there must come into all calculations the fact, that even a country, so far back number in many points of civilization as Russia, is to be counted as a well equipped competitor in milling and grain business to-day. And as with Russia so with other countries. Methods of transit, the railroad, the telegraph, the telephone, the cablegram, quick methods of putting the people of every country in touch with the rest of the world, are revolutionizing business to-day.

J. T. L.

The Chicago Board of Trade and the elevator proprietors have compromised their recent dispute. The rates on grain are to be $\frac{3}{4}$ c. per bushel for the first ten days, and $\frac{1}{4}$ c. for each additional ten days.

MILLING IN FRANCE.

FOLLOWING is a summation of a "Traité Pratique de la Meunerie" published recently in France : Among the ancient Gauls the grain was not ground, but was eaten in its natural state. Later the underground was cooked and eaten in "patés" or in puddings. The first attempts to convert the grain into meal or flour followed the system in use among the ancient Greeks, who covered stones with a light layer of damp grain, which was then dried in the sun and afterwards crushed with a heavy roller of stone or metal. The next stage in the evolution of the mill was the pounding of the grain in mortars with wooden pestles. Then came the flat millstones, which were made to revolve, the one on the other, at first by hand and later by animal power. Windmills, of which quite a number are still in operation in Brittany, and which are said to have been in use in the Orient long before the Crusades, were at this epoch introduced into France and generally utilized until about the middle of the eleventh century ; then, because of their irregularity, they began to be supplanted by water-mills. These were, at first, operated on boats anchored in bodies of water, but later were fixed in permanent constructions on the banks of streams. It was not until 1780 the art of modern milling was invented, as is claimed by two Frenchmen, Col. Ducrest and the engineer Favre. Their attempts to introduce the new process into France were futile, and they therefore went to the United States, where, with the co-operation of the American engineer, Oliver Evans, they established the first mill in the world using the *mouture basse*. The first mill of this kind in England dates from 1789, and the first in France only from 1816. Since that time three kinds of mills have been in use in this country, windmills, water mills, and steam mills. Except in Brittany, where windmills do the grinding for the small farmers, these mills have practically fallen into desuetude in France. A steam mill was, it is claimed, built in France as long ago as 1742, but it was not until 1816 the development of these mills began. The grinding was all done by millstones until 1873, when the system of porcelain cylinders, supplanted later by metal (steel or *fonte dur*) cylinders, was introduced. This system had been in use in Switzerland since 1832 and in Hungary and Italy for a number of years prior to 1873. A number of mills now use the cylinders ; in others the wheat is ground by millstones and compressors with cylinders are used to convert the grits into flour. The record gives the following comparative results obtained per 100 kilograms (220.46 pounds) of wheat by mill stone and by cylinder grinding :

Products.	By millstones.		By cylinders.	
	Basse (low). Kilo.	Haute (high). Kilo.	Basse (low). Kilo.	Haute (high). Kilo.
Flour of grits.....	30	36	30	36
First quality.....	68.4	10	72	36
Second quality.....	2.55	..	2	..
Third quality.....	4	34	1	25
Fourth quality.....	..	1	..	2
Issues.....	21	22	22	21
Waste.....	4.05	3	3	4
Total.....	100	100	100	100

The cylinder mills yield a greater porportion of superior flour than other mills, and their product is in greater demand among bakers and pastry cooks, especially in Paris. It produces not only a finer quality of bread and pastry, but it yields from 3 to 4 per cent. more bread than other flour. There are in France about 50,000 mills occupied exclusively with the grinding of grain. The annual consumption of wheat in France is about 340,536,000 bushels. This represents the respectable sum of \$358,980,000. These 93,000,000 quintals of wheat when ground into flour produce :

Description.	Per cent.	Quantity, Metric Quintals.	Price per quintal.		Value.	
			Quintals.	Francs.	Francs.	Francs.
Flour :						
First quality.. 70		65,100,000	30	\$5.790	1,953,000,000	\$376,929,000
Second quality.. 2		1,860,000	4	4.632	44,640,000	8,615,520
Third quality.. 3		2,790,000	8	3.474	50,220,000	9,692,460
Issues, (bran.) 21		19,530,000	14	2.702	273,420,000	52,770,000
Waste..... 4		3,720,090	..	..	..	..
Total..... 100		93,000,000	..	..	2,321,280,000	448,007,040

The millers not only grind wheat, but also the inferior grains, rye, barley, maize, buckwheat and oats. By adding the value of these different grains for the quantity that passes annually through the mills we reach a figure above \$482,500,000. These figures are made upon the basis of the unprecedentedly low prices of grain prevailing his year. At the prices prevailing in a year of scarcity they would exceed \$772,000,000. The French milling

industry is thoroughly organized. In 1886 the National Association of French Millers was founded. Its headquarters are in Paris, and it numbers more than 3,000 members, including the owners of all the great mills in the country. This powerful association holds an annual congress in Paris in September, where the various questions of practical or commercial interest to the trade are discussed. In connection with the congress a splendid exposition is made of milling apparatus, tools and materials. This organization is constantly on the alert against foreign competition in the French market and is a factor always to be considered by those who are interested in extending the demand for flour in France.

ONTARIO CROPS.

THE crop bulletin of the Ontario Government up to the middle of August is practically up to harvesting time. Fall wheat is reported a successful crop which was got in favorably, but spring wheat owing to droughts in the west, and excessive rains eastward, is light in both quantity and weight. Of barley, reports are that the average is low and only a limited quantity will be available for export. Oats will not be a large crop, and that of peas will fall much under the average. In regard to hay it must be remembered that the yield of 1892 was over one million tons greater than the average of the 11 years, 1882-92, and that the yield of 1883 was nearly 600,000 tons greater than that of 1892. The yields per acre of the past three years were as follows : 1891, 0.94 ; 1892, 1.74 ; 1893, 1.79 tons per acre. That of the present year is 1.39 tons per acre. The larger portion of the present crop is timothy and native grasses. There is less clover than usual in the first cutting. On the whole the quality is reported very good, as good harvesting weather prevailed over all parts except in a few eastern sections. Since the day of the report a severe drought has prevailed, which has done very serious injury.

Corn is a very variable crop this season, but on the whole, not likely to be an average one, the weather not having been favorable either in the earlier or later stages of growth and ripening. The same difference occurs in potatoes, western yields being very light, while others are excellent.

The average yields for 1894 are based on reports dated August 15. These are subject to revision after threshing. Revised reports will appear in the November bulletin. In 1893 and 1892 the November returns were less than those of August. Owing to the extraordinary drought the yields of the spring grain here given may be reduced. The report of hay is final.

Crops.	Year.	Yield per acre.	
		Bush.	tons.
Fall wheat.....	1894	21.6	
	1893	19.2	
	1882-93	20.0	
	1894	16.1	
Spring wheat.....	1893	11.7	
	1882-93	15.2	
	1894	22.7	
	1893	21.0	
Barley.....	1882-93	25.7	
	1894	30.4	
	1893	30.3	
	1882-93	36.6	
Oats.....	1894	15.7	
	1893	14.5	
	1882-93	16.1	
	1894	17.5	
Peas.....	1893	19.2	
	1882-93	20.4	
	1894	14.6	
	1893	13.6	
Beans.....	1882-93	17.1	
	1894	1.39	
	1893	1.79	
	1882-93	1.43	
Hay and Clover.....	1894	1.39	
	1893	1.79	
	1882-93	1.43	
	1894	1.39	

The total area under the above crops is 8,217,331 acres, as compared with 8,054,612 acres in 1893. The area devoted to pasture is 2,703,241 acres in an increase of 91,561 acres over 1893. Taking the report of Ontario crops as a whole they may be estimated as a low average, the variations in yield in different parts of the Province being unusually great.

Subscribe for the CANADIAN MILLER. \$1 per year.

BY THE WAY.

LARGE milling centers have usually been built up around valuable grain growing districts. Minneapolis is an instance before us. A more recent illustration is found in the development of milling operations in the Duluth and Superior sections of country. With some of the best wheat grown in America, and added to this excellent opportunities for shipment by water, we see to-day the milling strength of Duluth growing apace. Along this line the suggestion has frequently been made that ultimately Manitoba and the Northwest, because of their superior position as wheat growing countries, must also become a large milling territory. There is not a little force in this contention, despite the fact that there would not seem to be at the present time any necessity for an expansion of milling operations in this or almost any country. But the whirligig of time brings about many changes, and who would venture to say that changes helpful to milling on this continent may not appear in the horizon shortly? We are reminded of a possible outlook for Winnipeg as a large milling center in the strength that is being given to the water power of that district suggested by the fact that a company is building works to utilize the immense water of the Lake of the Woods at Keewatin, and that this power will be transmitted to Winnipeg by electricity. There would be here one strong advantage held by Winnipeg were it to enter into milling.

× × × ×

Those interested in agricultural callings continue to give thought to the question whether they must in the near future switch off from growing wheat as a leading product of the farm to utilizing the land in a more profitable way. The wide gulf between the returns for wheat and that from other products is perhaps rather absurdly illustrated in the story of the Wisconsin farmer who received a return of over \$600 worth of fruit per acre from 10 acres on which were grown black berries. Contrast this with say 15 bushels of wheat to the acre at even 60c, or \$9. per acre, and the inducements to continue as wheat growers is not strong. We cannot, however, turn the large acreage that has all along been grown in wheat into black berries, but many farmers are already switching off into dairying, cattle raising, and in disposing of a considerable percentage of their wheat feeding cattle.

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On another page we publish a valuable contribution from Mr. James B. Campbell, of Montreal, on the waterways of Canada and along with this will be found the views of Mr. James Fisher, M. P. P., of Winnipeg, on the same subject, giving the Manitoban opinion. It is hardly possible that something practical will not grow out of the amount of thought and consideration that is being given to this question at the present time. The subject has broadened, for not alone is it an uppermost question with the Canadian people, but its overlapping character is seen in the fact that it is a prominent subject of discussion in the United States. The fact is that the matter of canal building in the light of the scientific and mechanical progress that has been made in modern days, makes it reasonably certain that with the growth of railways in the past half century or less there is also to come an expansion of our waterways as a medium for the carrying trade of the country, that must also reach large dimensions. Chicago at the present time is planning a new waterway from Chicago to the Gulf of Mexico, which it is supposed will connect the Gulf of St. Lawrence with the Gulf of Mexico and give the windy city a supremacy as a commercial centre that cannot be attained by any other city. Suggested by this projected Chicago canal and like works in progress in other parts of the country Harper's Weekly of recent date devotes large attention to the question pointing out that the work of canal building to-day may be greatly reduced in cost as compared with the methods hitherto employed. Were something practical to be secured in this direction it would help to solve the canal question in Canada, for with the statement of the Minister of Railways and Canals that it would cost \$130,000,000, to make a 20ft. channel from Lake Erie to Montreal, at present what seems an unsurmountable difficulty, is the matter of cost. But the contention of Harper's Weekly is that by means of improved dynamite dredges the work of excavation,

transporting and depositing is greatly simplified and the cost reduced. The statement is made that this work would be done at less than half the cost of similar work on the Manchester canal. If our people can see their way out of the financial difficulties of canal building one great obstacle will have been removed.

× × × ×

A letter from a correspondent in Manitoba, published in another column, referring to the high elevator charges, was evidently written before he had received news of the reduction in the charges for handling grain on both interior and terminal points made by the Canadian Pacific Railway. This railway has reduced terminal elevator rates to about 50%, and a reduction of $\frac{1}{2}$ c a bushel has been announced in interior elevator rates. "This," says the Commercial, of Winnipeg, "will amount to a saving of about one-quarter million dollars in handling this crop and will be of great benefit to the farmers."

× × × ×

The Globe a few days ago made the following criticism on the changing of standards of grain every year: The present method is to strike an average of weight, fullness and other qualities by examining many samples, and to establish that for the season as "No. 1 hard"; wheat of better quality is graded "extra," and the lower grades is "No. 2 hard." A purchaser in Europe buying wheat from many countries deals in Canadian "No. 1 hard," and naturally regards it as a fixed standard. A favorable year advances the quality of this standard, and the buyer is reluctant about advancing the price in comparison with fixed grades. An unfavorable year lowers the standard, and has a tendency to make buyers suspicious. They expect certain qualities in Canadian "No. 1 hard," and are disappointed. Another objection is the necessary delay in the early fall before the standards are fixed. The inspectors will not leave for Manitoba until Saturday next, and until they make their selections and fix the standards there can be practically no trade in wheat. There would be many advantages in the adoption of permanent standards, which could be learned and recognized in European markets.

FREIGHT RATES AGITATION.

THE Commercial, of Winnipeg, Man., suggests that if the Dominion Government is seriously looking about for a policy to go to the country with at the next election, it will find such in the question of freight rates, as fixed by our leading railways. There can be no doubt that this grievance of excessive, unfair, and discriminating rates is one that is being shoved to the front as a question that the government cannot ignore. It may seem at first thought that this is a matter which simply interests the commercial classes. They are indeed deeply interested, as in some shape or other the matter is constantly before them. In a measure they are daily paying the piper. But the grievance is more wide spread than this. The prices charged for every article of consumption sold over the counters of the smallest corner store are effected by the charges for carrying made by our railways. The millers of the country have been pushing the agitation against excessive freight rates with more vigour, perhaps, than any other branch of business. Some of the evils of discrimination have come home to them more closely, possibly, than to other lines of manufacture, because of the condition of the milling trades at this time. Profits in milling have got down to so fine a figure that a slight difference in freight rates, when the miller is brought into competition with millers of other countries, is enough to easily wipe out the margin of profit that he may have figured on. During the period of a year or more, however, that the freight committee of the Dominion Millers' Association has been investigating this question illustrations have come before them more than once showing that to a relative extent the evil in freight rates that they complain of has a lodgment in other departments of trade besides milling.

In Manitoba and the Northwest, the agitation for relief in this direction is growing with unmistakable force, and there can be no doubt that, whether the government makes the question a plank in their platform when they appeal to the country for public approval at another time, or quietly ignore it, the question will certainly, so

far as Manitoba is concerned, confront them with marked determination.

Writing simply from the millers' point of view the railways and the government may rest assured that there is no intention to ease off on this agitation until relief is secured, and more and more it becomes apparent that the question is one confined to no one class of the community. Patrons are devoting their share of attention to the matter from the standpoint of the consumer and when the subject comes to be one of popular agitation both on the part of the man who sells the goods and he who buys them, we may expect that there will be rather more than a "tempest in a tea pot" for all who have authority to make or regulate freight rates.

What is worth remarking here is that this agitation for lower freight rates is not confined to Canada. United States shippers of wheat and flour, especially those in the northwest, southwest and the Pacific coast, are moving actively for a reform in this direction. The Chicago Elevator and Grain Trade of recent date has an article on the question where it is significantly said: "The carriers' old rule for fixing rates—"what the traffic will stand"—could be applied to the re-establishment of the rates on wheat with satisfactory effect."

A DIFFERENTIAL SPRING GOVERNOR.

A DIFFERENTIAL spring governor for steam engines is among the recent mechanical inventions of note, the device possessing the advantage of being applicable either to control a valve by which steam is admitted to the engine valve chambers, or to directly actuate the cut-off mechanism of any customary type of valve. In its construction there is a fulcrum lever, one arm of which connects the device with the valve or cut-off stem, and the other with a collar sliding upon the governor spindle. The governor balls, or weights, have short arms connecting with a bar fixed to and rotating with the spindle, and other arms extending outwardly on the opposite side connecting with the bar which is slidable upon the spindle and which actuates the movable collar. The angles formed by the levers—which extend out from the opposite side of the balls or weights—are internal angles, so that, as the balls are thrown outward, these balls are brought more nearly into a straight line with each other. A compression spring acts to return the parts when the centrifugal force is reduced.

MILLING RYE.

RYE milling methods, says the American Miller, are longer than corn and shorter than wheat. The longest thing about rye milling is the cleaning of the grain in its preparation for reduction. While rye is of the same general form as wheat and looks a good deal like it, yet it is an entirely different grain to mill, and more particularly so in the matter of its cleaning. An analysis shows that the cells, germ, epidermis, in short the whole texture is of an entirely different nature from that of wheat. Examining the epidermis, or outer layer of hull, or bran on the rye berry, it will be seen that it is much lighter, thinner and darker than on the wheat berry, and is partially loose on the berry and can be easily removed by rubbing. This covering seems to be somewhat of a scaly nature.

In cleaning wheat we have been taught to be very careful not to be too severe. In cleaning rye we have to be careful to be severe enough and remove all of this outer covering before attempting to reduce the grain. Not being tough like bran, this covering will become detached and pulverized in a way to make rye flour specky and generally of less value.

A SUGGESTION RE. PULLEYS.

THE editor of the Engineering Magazine says that the flesh side of leather is the best to place against the pulley when such leather is used as a belt, notwithstanding this to be contrary to the most usual practice, but this general practice is due to the ideas of belt makers rather than to those of belt users. Traction, he says, is greater than where the surface is elastic and has a clinging tendency than where it is hard and smooth. This is because this kind of surface clutches the pulley more securely by being pressed into all the pores and interstices of the metal or varnish.

EUROPEAN MILLING INVENTIONS.

INVENTIONS in the line of milling machinery in the United States nowadays are few and far between. Over in Europe there is some activity, mostly in unimportant lines. Among recent inventions patented in Great Britain is a cleaning and dressing machine, the invention of F. Holtzhausen, of Nossen, Saxony, Germany. This invention relates to a machine suitable for treating grain or granular materials. A drum carrying brushes or emery composition is mounted on and driven by a central shaft within a perforated casing. The casing is supported and driven by friction-wheels placed one at each end. The casing is further supported by wheels at each side, which may be adjusted to regulate the distance between the casing and the central drum. The method of adjustment for the wheels consists in mounting them on the side, which is hinged or equivalently secured at its lower end and is provided with arms at its upper end, which may be fixed in any position between nuts in the threaded rod.

Another is a middlings-purifier, invented by W. W. Willis, of Ipswich, England. This is a machine for sorting or purifying middlings or the like by means of a current of air, which is caused to circulate continuously within the enclosed casing of the machine. The figure shows one modification, in which a sieve is introduced to assist still further the purification of the middlings. The middlings are fed from a hopper through the current of air as it passes the fan. The middlings fall, according to specific gravity, into three hoppers. The contents of the first hopper fall on the sieve formed in sections and carried in a frame having pieces of flexible cloth all round to prevent the entrance of air and operated by an eccentric. The material passing through the sieve falls into a hopper in the bottom of which are a number of valves, by means of which any portion of the siftings may be discharged into either one of two conveyors placed side by side and arranged to discharge the material through shoots. The overfalls fall down the shoot into one of the conveyors, being subjected to aspiration by a current of air passing up a channel. The contents of the second hopper pass down a trough to be mixed with the overfalls. The finished offal is discharged from the machine by a shoot and is collected in the shoot from trays, which are placed over the sieve from a valve, through which all the material which falls into the third hopper is passed, and lastly from a valve, through which all the material which collects in the hopper of the aspirator is passed. The dust is collected in and discharged from a hopper. The dust is separated from the air in a chamber, in which are a number of baffles, and in an expansion chamber, in the bottom of which works a brush which sweeps the dust into the hopper. The air-current is produced by a fan. Suitable valves are provided for directing and regulating the strength of the current. A modification is described, in which one of the sieves are dispensed with.

Another invention, by J. M. Rishworth and J. Vickers, of Leeds, England, relates to sifting or screening. In this machine, to prevent the flour from adhering as it drops from the reel, the hopper sides are arranged to slide in the frame and are provided with brackets in the paths of revolving cams, and with springs by means of which they are moved upward and then retracted respectively. The sides are readily removable to obtain access to the worm.

Another is a middlings purifier, invented by L. H. Neave, of Fordingbridge, England. In this invention the object is to collect and remove the dust from above the sieves of middlings-purifiers. Above the sieve are transverse bars with openings between them; scrapers on an endless chain travel over the bars and openings, causing the air to be drawn through the openings by the fan intermittently, and thus allowing the dust to deposit on the bars and scrapers. The scrapers are cleaned by brushes supported over a conveyor.—Milling World.

A new material intended to be used as a substitute for leather in covering belt pulleys is made of wood pulp combined with various ingredients for making it tough and pliable. It may be secured to the face of the pulley in such a way that the rivets will not show through the working face.

SOME ENGINEERS.

WE recently came across an engineer who was grumbling over the safety valve on his boilers. Formerly he had two lever valves, one on each boiler, but some one, he says, got afraid of the lever valves and induced the owner to join the outlets from each boiler into one pipe and provide for this a long pop valve. There was no valve between the pop and boilers, which was right enough if that way of doing things was to be continued, but what the engineer objected to was having one valve do service for two boilers. The boilers must be run together or not at all, and if anything should happen to one it would not be possible to cut the other out, but both must act together. This was wrong and it ought to be obvious to all who had anything to do with these boilers, and though the engineer recognized the defect he did not have spunk enough to make a vigorous "kick" for a valve on each boiler. Such an arrangement is not safe. Each boiler should be provided with its own safety valve, and should be so piped that it can be cut out from all connection with the rest of the battery when occasion ever demands.

All engineers, however, are not like this one, and there are those to be found who have the stamina to object pretty forcibly when anything is wrong about the plant. We recently came across two such cases, and in both cases the engineer came out ahead, and with employers that had the reputation of being obdurate. Both cases were of boilers providing steam continuously, night and day and Sundays to, and in both instances there were two boilers. In one case the engineer could find no record that the boilers had ever been inspected or even shut down for cleaning out. Possibly they may have been, but not since he came there two years before. He stood it as long as he could, asking for an opportunity to inspect the boilers, but the owner would not allow the necessary shut down. Finally the engineer stated that he was prepared to leave his position unless he could inspect those boilers. He had stayed around them as long as he was going to without knowing what they looked like inside, and if anything happened to the boilers he wanted the owners to understand he would be willing to say about how little care they got. The owner did not care to run any risk, but his disposition had been simply to put off the inspection as long as he could. This challenge was too much, however, and the engineer drew out the fires and cooled the boilers off for inspection, and the owner fumed and fretted for two days while the engineer was fixing things up in a manner more to his satisfaction. No defects were found, but the boilers were very dirty, and after it was all over the proprietor told us he was glad of it as he began to feel a little uneasy himself and rather welcomed his engineer's objection.

In the other case the engineer had only been at work in the place a week when he found out the plant was in poor shape and had had no regular inspection though his predecessors (there were several) had asked for it. He went up stairs and told the owner he was going to shut down one of the boilers the next day to inspect it. The storm broke over his head, but he would have nothing else and the owner gave way and the inspection revealed a pretty condition of affairs and the need of many repairs. Here again the result justified the engineer's firmness. From a somewhat varied experience with steam users of this kind we are convinced that if engineers were more positive in asking for what they wanted, coupling it with some intimation that they understood and could show exactly what the end in view was, they would get their requests more readily granted. Steam users do not, as a rule, care to run many risks, but they often hate to spend a cent, and if the engineer is timorous in asking, and they can bluff him out of it, they feel that the thing asked for was not really important or the engineer would show more plainly that it was. These two cases clearly show where some steam users stand, and if the man with the single pop valve will raise a vigorous objection he will undoubtedly get another pop so they can be separated.

The first of the two engineers above mentioned also tested his boilers by hydrostatic pressure, as well as by looking them over, and in talking it over he said, "I ran it up to 250 pounds and it did not show a weep." Now that was a good record for that boiler, but it was

a very foolish thing to do just the same, to submit any boiler to such a tremendous strain. That was not a test alone, but an effort to burst the boiler in reality. The boiler carried a steam pressure of 90 pounds, and to submit it to 250 pounds pressure was altogether out of reason and common sense, and submitting the boiler to a strain it should never be called upon to stand. The purposes of a hydrostatic test are amply answered when the pressure is run up to 50 per cent. greater than the working pressure, and such proportion should never be exceeded because it unduly strains a boiler and a boiler once so strained is never as good as before. The engineer did a good thing in getting an inspection of his boiler, but he should have known more about how to inspect that boiler.—Boston Journal of Commerce.

FOOLISH TRADE NAMES.

ONE gets sick and tired of trade names, such as victor, ideal, paragon, excelsior, and the like, also wonders how the makers of machines thus named can afford to waste the effect produced by using the maker's name instead of these pseudonyms. The name of a firm or company applied to a machine such as a waterwheel, gas engine or a moving machine, is of real trade value, and comes constantly into use, but a nickname rarely ever does. Gas engines are thus afflicted, but not steam engines, the latter being accorded too much respectability for a nickname. We have, out of regard for the machines and believing it to be vastly to the advantage of the makers, never printed one of these names when it could reasonably be avoided.—Industry.

THE HUNGARIAN CROP REPORT.

THE annual crop estimates issued by the Hungarian minister of agriculture were published on September 1, the delay in their issuance having been due, it is alleged, to the care bestowed upon the revision of the report. According to these estimates, the wheat crop of the world will be 2,476,000,000 bushels for 1894, against 2,279,000,000 bushels for 1893 and 2,280,000,000 bushels, the official average, for the past decade. The deficit requiring to be covered by importing countries is 364,526,000 bushels for 1894, against 379,000,000 bushels in 1893. The surplus from exporting countries is 444,245,000 bushels, against 378,664,000 bushels in 1893. The detail figures representing the production and deficit of the various importing countries for the year 1894 are as follows:

	Production Bushels.	Deficit. Bushels.
Great Britain.....	60,995,000	170,220,000
France.....	354,625,000	19,859,000
Germany.....	102,132,000	32,625,000
Italy.....	120,228,000	29,788,000
Holland.....	6,241,000	11,915,000
Switzerland.....	7,376,000	11,915,000
Belgium.....	21,277,000	25,533,000
Denmark.....	4,539,000	1,702,000
Sweden and Norway.....	5,106,000	7,092,000
Spain.....	97,876,000	12,768,000
Portugal.....	9,078,000	5,675,000
Greece.....	3,404,000	3,972,000
Austria.....	45,400,000	31,774,000

The figures in detail of the production and surplus of exporting countries are these:

	Production. Bushels.	Surplus. Bushels.
Russia.....	363,136,000	141,850,000
Hungary.....	151,098,000	45,392,000
Roumania.....	51,066,000	19,859,000
Turkey.....	29,793,000	5,675,000
Bulgaria.....	31,207,000	13,050,000
Servia.....	9,929,000	1,985,000
United States.....	408,528,000	70,925,000
Canada.....	42,555,000	15,605,000
India.....	258,166,000	22,696,000
The rest of Asia.....	58,158,000	2,837,000
Africa.....	48,370,000	5,957,000
Australia.....	42,895,000	14,185,000
Chili.....	24,114,000	9,929,000
Argentine Republic.....	117,508,000	73,762,000

Just how far complete reliance is to be placed on these figures readers can judge in part from the information in their possession of the size of the crops near home.

THE trolley car was put to a new use in a near-by city one morning recently. A thief was escaping in a hack, and a policeman boarded a trolley car, and the motorman let her out in chase. The horse gave out first, and the thief was captured. Some good in the trolley car after all.

INDIFFERENCE TO BOILER FIRING AND MANAGEMENT.*

OBSERVATIONS extending over a period of a quarter of a century in a practical and professional way have presented opportunities to note, in the greater number of manufacturing establishments, a continuous decline in the grade of service of those in positions of firemen and boiler room managers, this corps of operatives seeming at least, to have remained in *statu quo*. The evil has become so glaring and the results so palpably fraught with disaster, destruction and waste, as to warrant an effort to call the attention of those who desire to progress to the false and inconsistent position they occupy by permitting such a narrow policy in management, so widely at variance with true economy, ignoring directly that the better intelligence renders the more valuable, and hence, more profitable service.

It goes without saying, that, during the past ten years concentration of efforts by scientists and eminent mechanics looking to the more perfect development of the steam engine in its various types, has produced results which challenge the admiration of the most critical in this line of thought.

Within the same period, from every source, there has been a multitude of features in the form of designs and novel application of boilers, all converging to the important factors of increased economy, safety and efficiency. In the engine sphere, condensing, compound and triple expansion engines, with or without jackets; in brief, seemingly all the necessary refinements have received, and are receiving close attention. In the boiler domain there has been, also the evolution from the plain cylinder type to tubular, and from that through the multifarious forms of water tubes, each striving for a superior degree of excellence. Combining these forces, viz., the boiler and the engine, the amount of research and practical application that have been, and are being applied for efficiency and economy, are such as to be almost incalculable. A retrospect of the past, viewed in the light of present results, shows that these efforts have been of an exceedingly fruitful character.

The development has carried with it the imperative advancement of those in charge of engine management to such an extent as to create almost anew this body of men. Such an intellectual advancement in the department of mechanics, we believe, is without precedent, and in every sense challenges universal admiration from every quarter. Notwithstanding these favorable features, we are constrained to say that all this is somewhat like the play of Hamlet with Hamlet left out; or in other words, we are radically defective at the very threshold of this field, by reason of relegating the firing of boilers to the most ignorant of operatives; or, to put it in a plain way, there seems to be an almost unanimous idea that anyone who can shovel and throw fuel is good enough for a fireman. Close observation and contact for a period of years with numerous plants of varied character increases the conviction upon this point. Recognizing, as we all do, that the furnace of the boiler is the prime feature and great initial point from which is the source of power, does it not follow that, if economy and efficiency are deserving of efforts in the advanced stages, as has already been pointed out, this is the very point that should be treated with every consideration of intelligence? Should not the fuel, furnace and boiler receive the thoughtful attention that the engine receives from the careful engineer? I think this will be accepted by every one interested in advanced ideas. No one, I think, will question the fact of the importance of the initial point of the boiler and its furnace, and that, upon its mismanagement, the efforts of refinement are rendered, in many cases, completely void. It would seem so simple that argument would be unnecessary, were it not that, on every hand, the matter is entirely ignored, resulting in waste and destruction. We would ask: Are not the efforts of the best furnace designers completely set at naught often by reason of the manner in which they are operated? Is it not a glaring fact that in all cities where smoke abatement has been, and is being attempted, the great stumbling block is the low grade of intelligence and difference of the operatives?

In looking up this subject from a mechanical and engineering standpoint, we are fully alive to all the

requirements to give complete combustion and thorough distribution of heat units; proportion of grate area and openings, proper amount of air, conduction of the heated gases, are all carefully considered. When all is completed, we have had the wonderful spectacle of these conditions being turned over to the simple treatment of rain jam shovelling and slice bar operations. I claim that the fireman should know, at least, the elements of combustion, the importance of the proper management of fires to produce the greatest results with the least expenditure of fuel. The intelligent engineer keeps this constantly in view as to steam economy; the valves, etc., receive his unremitting attention, unless he can properly be placed upon the same plane as the fireman that shovels without intelligence or judgment.

Now, it may be said that this is being greatly overcome by application of mechanical stokers, a point that is frequently (and I believe, without thinking) claimed by those interested in placing stokers. This is a great mistake, well known by those conducting tests, results always being superior with the greater intelligence of the operator of the machine.

This deplorable and absurd state of affairs is doubly aggravated by, not simply indifference, but actual encouragement, based upon the idea that anyone can shovel or throw in; or perhaps it is the idea of—they put it in the slot, and we do the rest. Does it ever occur to those proprietors, or the superintendents of manufacturing establishments, that while they are straining at gnats in the refinement of every application in the various departments looking to more economic results, right upon the threshold, they are swallowing a camel with the greatest ease?

Within the past few years, in every community where cleanliness, taste and good health are considered, there has come forth a crying appeal to the authorities to lessen the great evil of smoke in the atmosphere. In response to this, inventive genius has promptly come forward. The multitude of devices that have been perfected and put in operation furnishes ample testimony to this fact. Many of these when properly operated, accomplish satisfactory results in smoke abatement, but no inventor has ever had the temerity to label his machine, "No skilled fireman required." Per contra, it is well known that the most intelligent fireman produces the best results, and it is also an undeniable fact that the best results are set at naught by incompetent operating. The writer has been brought in contact with large fields of boiler practice, and in many cases, aside from other disqualifications, the firemen were unable to speak or understand a word of the English language. It may be said, as I have heard it said, that these men are not paid to think, but to do. Well they do do. They will do up a coal pile, furnace and boiler with alarming rapidity. I say alarming to those whose views are broad enough to consider the initial and important points. On the other hand, it is a lamentable fact that there are a great number of persons in official positions, as superintendents and proprietors of establishments, who seem to be utterly incapable, or unwilling, to note the importance of the necessity for a higher grade of labor in the firing and management of boilers.

One of the most surprising features in connection with this state of affairs is the tendency of those to place boilers, claiming, among their numerous merits, that of less attention required than others, precisely on the old exploded idea applied to engines, "No skilled engineer required." I have now before me a letter from a boiler representative who claims that his boiler will give the utmost satisfaction with one half the attention that others receive.

What is greatly needed at present is to lay aside the idea that anyone is good enough to fire and manage boilers. When you engage a man for your office, do you not require that he shall possess some qualification for the position? And if aptness is shown, do you not show appreciation by advancement to a higher plane, the interest being mutual? Why not apply this to the selection of firemen? As it now stands, we cannot but exclaim, "Strange, what a difference there should be 'twixt tweedle dum and tweedle dee!"

There are a great many plants in operation where, by incompetency in this line, the steam efficiency is greatly lessened, furnaces and boilers working in ne-

glected conditions, and the community begrimed with volumes of unnecessary smoke; and in addition to these evils, is that of jeopardizing lives and property. Unless this matter is considered, and such action taken as will improve this corps of operatives, it would seem absurd to be continually reaching and extending into the higher refinements of steam engineering, when such simple and important features are ignored at the threshold.

Under these conditions, does not the pertinent question present itself to the employer—are we not occupying a false position by this seeming indifference? Do we not retard the development of a class of labor which by recognition, by an appreciation that some skill and judgment are required, would be animated by the smallest spark of ambition to qualify for advanced position? Is not this condition of affairs a gross inconsistency, nay, a mockery, in the face of the query put by those guilty of this indifference—why can we not get better men than this? In reply to that, would say, simply, it is not sought on your part. Just as long as this class of operatives are looked upon as mere shovelers, throwers of coal and carriers of water, ignorance, with all its attendant waste, destruction of property and general demoralization, will be prominent in the boiler department.

As a fitting close to this, it would be proper to ask what degree of intelligence or knowledge would qualify one to fire boilers.

First. That the fires should be maintained with uniformity, and that no openings, in the form of bare places, show upon the bars to permit the cold air to pass through.

Second. The judgment that will enable him, by a glance at the ash-pit, to know at once, to a great extent, the condition of the fires.

Third. He should know something of the various fittings of the boilers, such as valves, etc., and the details of the furnaces.

Fourth. But not least, an ambition to grasp the details, so as to qualify him for a still higher plane, which would certainly follow, provided there was judgment enough in the superior to note such details.

Sufficient, we think, has been said to convince the most obtuse mind that the indiscriminate employment of labor for this purpose is a crying evil, and some consideration given to the claims here made, that simply because one can shovel and throw, it does not follow that he is qualified to fire and have charge of steam boilers.

CAN IT?

IT has been asserted that with the same wheat a good roller mill having a sufficient number of machines can perform its work with the same amount of power as is required by a stone mill of the same capacity. Australian, New Zealand, English and American red winter wheats, when in good condition, can, it is claimed, be reduced to flour by a roller plant with an expenditure of about 6 to 8-horse power per sack of flour. Next to these varieties might be classed ordinary English, white Canadian, and Dantzic wheats, which grind easily, but, as a rule, dress badly, and therefore could not be made into flour so rapidly as the first named. If spring American, soft Indian, Saxonska, and Black Sea wheats, as well as some other European wheats, being of a glutinous and steely character, be used, more power will be consumed, and for these wheats 8 horse power as a minimum will be required. Next would come hard Indians, such as Calcutta, Kurrachee, etc., which, it is asserted, will take not less than 10 horse power.—The Miller, London.

JOURNAL BOXES.

JOURNAL boxes are now made which retain the oil and required replenishing only three or four times a year. Their additional cost over the old style is but trifling and their use will save a large expenditure. They should be adopted by every live mechanic. Pouring oil on heated journals is wasteful: water is much better. Indeed, water is an excellent lubricant so long as it remains in place between the journals and box. If, like oil, it could be kept there, it would afford one of the best means of lubrication. Oil after having passed heated journal and box is comparatively worthless for lubricating purposes.—Tradesman.

* By D. Ashworth, before the Engineer's Society of Pennsylvania, Nov. 21, 1893.

EXPERIMENTS WITH WINTER WHEAT.

CONFORMING with the regular custom at the Ontario Agricultural College certain experiments were made during the past season in connection with the growing of winter wheat, and the results of these we now have in a bulletin prepared by Mr. C. A. Zavitz, B.S.A., of the College.

There were 178 plots used for the winter wheat experiments in 1894, these being divided off as follows : variety tests, 102 plots ; dates of seeding, 36 ; methods of seeding, 12 ; selection of seed, 8 ; quantity of seed per acre, 6 ; sowing spring grain to act as a mulch for wheat, 4 ; and harvesting at different stages of maturity, 10. As the variety tests have been conducted for five years in succession and the rest of the experiments for only one or two years, this bulletin treats more particularly of the varieties grown than of the methods of cultivation.

The field upon which the grain was grown is a good average clay loam, quite uniform in character, and has a gradual slope towards the northeast. The size of all the plots was 1-100 of an acre, with the exception of those for different dates of seeding, in which case it was 1-160 of an acre. The yields per acre have been calculated from the actual results of the plots. The land was prepared on the bare fallow system, and received a dressing of fifteen tons of farmyard manure per acre in the summer of 1893. No other fertilizer was used. Four crops had been removed from the land since it had received farmyard manure previous to last year.

Seeding took place early in September, and during that month 1.3 inches of rain fell, which was slightly below the average of the four years previous. The growth of the wheats in the autumn was good, and the amount killed out during the winter and early spring was small. April proved to be a very dry month, and May one of exceptionally wet weather ; the growth of wheat, however, was quite good throughout. The ripening of the grain took place between the 15th and 23rd of July, which was fully three days earlier than in any of the four previous years. The trouble from both rust and smut was not serious this season.

Soon after the grain headed out, a storm caused the weak-strawed varieties to become considerably lodged, which interfered with the proper filling of the heads. To determine the effect produced by the lodging of the crop, an examination was made of four varieties, which were partly lodged about five weeks before the ripening season. From each of these varieties 1,000 heads were collected out of the standing grain and also 1,000 heads from the lodged portion of the crop. The sheaves were threshed separately and the results recorded, the following being the summary :

Condition of crop.	Weight of grain from 4,000 heads.	Weight of 4,000 kernels of grain.
	ozs.	drs.
Standing	121½	82
Lodged	67	73

Providing the plants which lodged were equal in every respect to those which did not lodge, these results go to show that the loss to the grain through lodging was about 4.5 per cent. in yield and 11 per cent. in quality.

80 varieties of winter wheat grown in 1894 upon plots exactly similar in size and situated side by side. Paths three feet wide were left between the plots. Seeding took place on Sept. 2nd with all the varieties excepting Nos. 56, 58, and 65, which were sown three days later, and No. 54, which was sown seven days later. The grain was sown by hand at the rate of 2 bushels per acre, and then the land was harrowed. The average yield in 1894 was superior to that of 1890, 1892 or 1893, but was not equal to that of 1891.

The following remarks are made upon the varieties which have given the largest yields of grain per acre for the number of years they have been grown on the plots :

Early Red Clawson. This variety gave the largest average yield of grain per acre, and also the lowest average weight of grain per measured bushel among fifteen varieties grown for five years. The crop is much inclined to lodge in unfavorable seasons, but when it stands

well, the bald heads, red chaff, and white straw give this variety an attractive appearance when seen standing in the field. It will be remembered that the Early Red Clawson stood third in average yield per acre in the co-operative experiments over Ontario for 1893, at which time eleven varieties were tested.

American Bronze. The special feature of the American Bronze is that the crop usually stands well, while that of many other varieties becomes badly lodged. It is also a good yielder, and the average weight of grain per measured bushel for five years is nearly up to the standard. The chaff and straw are white, the heads bald, and the grains large, fairly long, and of an amber color. Among the eighty varieties of winter wheat grown on plots in 1894, the American Bronze was one of the finest looking at the time of harvest. I may add that this variety is somewhat subject to rust in unfavorable seasons.

Dawson's Golden Chaff. In yield of grain per acre, the Dawson's Golden Chaff takes the lead among all the varieties which have been tested at this station. In 1894 it gave 18.5 bushels per acre more than the average of the eighty varieties grown, and 5.6 bushels per acre more than the variety which stood next below it in yield. This wheat has been grown on the plots for three years, and leads in yield of grain among the forty-three varieties grown for that length of time. In the co-operative experiments over Ontario in 1893, when eleven varieties of winter wheat were tested, the Dawson's Golden Chaff not only gave the largest average yield of grain in the sixty experiments, but also headed the list in thirty-five out of sixty of the individual experiments. In three years trials, at the Experiment Station, the Dawson's Golden Chaff stands exactly equal with the American Bronze in strength of straw, these two being the stiffest strawed varieties. The average weight of grain per measured bushel for the Dawson's Golden Chaff during three years is 59.3 lb., which is also exactly the same as the average of the fifteen varieties of white wheat grown for the same length of time. This variety is apt to rust in some seasons, but it has been quite free from smut at this place, although some trouble with smut in this variety is reported from one or two of the localities where it is now grown. The Dawson's Golden Chaff is quite distinct from any of the other varieties grown, and when ripe most closely resembles the Standard and the Clawson (white) varieties. The straw is medium in length, and the crop has a golden appearance. In 1894, it was grown on eleven plots in the Experimental Department, and on about four acres in the Farm Department ; and was unanimously pronounced the most attractive variety at this station by five judges who examined the standing grain.

Early White Leander. Although this variety gave the largest average yield of grain for two years, among eight varieties grown on the plots in 1893 for the first time, the weight of grain per measured bushel was the third lowest, among eighty varieties grown this season. It possesses long straw ; long, bald heads ; white chaff, and white grain of medium size.

Early Genesee Giant. This variety has been grown on the plots for two years, but, owing to the lateness of receiving the seed in 1892, the results were not reported the first year. It stood fourth in general appearance of standing grain, and seventh in yield of threshed grain, among eighty varieties grown this year. The straw is tall and fairly strong, the heads bearded and quite compact, the chaff red and the grain white.

Concise statements regarding the experiments in wheat cultivation :

Different Dates of Seeding. The average results for two years in sowing winter wheat on September 2nd, September 9th and September 17th, are slightly in favor of the middle date ; but, as the crop from the first sown grain was the most lodged in 1894, future experiments may give different results.

Methods of Seeding. By sowing winter wheat from all the tubes of a grain drill, the average yield per acre was 44.6 bushels ; from every second tube of a grain drill, 42.2 bushels ; and by broadcast with the hand, 43.6 bushels.

Selection of Seed. Several experiments in the selection of seed grain were conducted, but they were too complicated to report in this bulletin. It might be mentioned, however, that in 1894 plump seed produced

heavier grain than shrunken seed ; but the difference in the yield per acre was very small.

Different Quantities of Seed per Acre. Two varieties of winter wheat were each sown on small plots at the rate 1, 1½ and 2 bushels of seed per acre, and the average results show that the largest yield was obtained from the thickest seeding, but the best quality of grain was from the medium amount of seed. The proper quantity of seed to sow can be best determined by the various wheat growers themselves, as much depends upon the variety of grain, fertility of the soil, etc.

Sowing Spring Barley in the Autumn, to form a Mulch for Wheat in Winter. Two varieties of wheat were sown with and without spring barley on September 5th, 1893, and the results go to show that slightly better yields were obtained when the barley was not used.

Cutting Grain at Different Stages of Maturity. Two varieties of winter wheat which were considered about right for cutting by the 19th of July, were cut on July 4th, 11th, 19th, and 25th, and August 2nd. The heaviest grain was from the cutting on July 19th, and the largest yield of grain on August 2nd. The lowest results, in both these particulars, were from the first cutting.

The conclusions reached as a result of the experiments are as follows :

1. The average results of winter wheat grown on the experimental plots for five years in succession are as follows : Weight of grain per measured bushel, 60.6 lbs. ; yield of straw per acre, 2.74 tons ; and yield of grain per acre, 40.6 bushels.

2. Among eighty varieties of winter wheat tested, the following have made high records : (1) Dawson's Golden Chaff ; (2) American Bronze ; (3) Early Genesee Giant ; (4) Surprise ; (5) Early Red Clawson ; (6) Golden Drop ; (7) Jones' Winter Fife ; (8) Bulgarian ; (9) Early Ripe ; and (10) Pride of Genesee.

3. The Dawson's Golden Chaff has made the best record of all the varieties of winter wheat tested in the Experimental Department.

4. Within certain limits, the amount of straw produced by a winter wheat is a poor indication of the yield of grain.

5. For five years in succession the bearded wheats gave a larger average weight per measured bushel than the bald varieties.

6. The white wheats have given the best results in favorable years, and the red wheats in unfavorable years.

UTILIZING DISTANT WATER POWERS.

THE utilization of water power, says a writer in the Age of Steel, probably ante-dates written history, the interval between crude and primitive methods and the latest triumph of engineering skill at the Niagara Falls covering the entire period of human progress and civilization. Here and there where the bones of extinct races have mouldered into dust and centuries of time have been silent and blank, traces have been left of man's attempt to utilize the running stream and the falling cataract. Down to our own immediate times and in sundry fashions and places the water wheel and the dam have been familiar objects.

It has, however, been left till the advent of electricity for the real value and scope of this force to be generally recognized. By this means the conveyance of power to great distances has been made possible, its service being no longer limited to immediate localities. It is in this sense that natural forces are multiplied by extending their area of service, and each new science as developed becomes the handmaiden of the rest. In fact, none are complete until all are a unit, and till the last is added the rest are immature. Electricity promises to be one of the most potential of modern forces in making this fusion, and in the wide distribution of energy from waterfalls may practically revolutionize industrial conditions. In this country, where enterprise is alert to any and every advantage, the revival of interest in water power is spontaneous and general. There can be no doubt that this revival of interest will continue and keep pace with our industrial progress wherever water power is economically available.

THE NEWS.

—A. Moyer & Co., of Listowel, are rebuilding their elevator recently burned.

—William Gibson is putting up and will operate a grist mill at Rockburn, Que.

—Joseph Kidd's new flour mill at Prince Albert, Ont., is nearing completion.

—C. E. Tugwell, flour and feed, Victoria, B.C., has sold out to Rostine & Co.

—Walter Welsh, a grain dealer at Stoney Point, Ont., has made an assignment.

—George Haskins has just completed the erection of a new roller mill at Delta, Ont.

—The erection of a grain elevator at Oxbow, Assa., has been decided upon by R. D. Martin & Co.

—Orr Bros., of Windsor, have recently erected a large elevator in connection with their flour mill.

—The company recently formed to erect a flour mill at Virden, Man., have commenced operations.

—Chas. H. Gould, sr., of the milling firm of Ira Gould & Sons, Montreal, died recently, at the age of 68 years.

—The Montreal Transportation Co. is building a barge at Kingston to have a capacity of 55,000 bushels of grain.

—Sutherland, Innes & Co., have commenced to rebuild their coopeage at Rodney, Ont., recently destroyed by fire.

—E. D. Tillson, the well-known miller of Tilsonburg, is filling an order from a firm on the Canary Islands for flour and feed.

—Alex. McLaren, miller and general merchant, Colden and Osceola, Ont., is advertising general business at latter place for sale.

—Over 150,000 bushels of wheat have been purchased from the farmers of the section by Mr. E. D. Tilson, of Tilsonburg, during the past year.

—J. H. Dracass, proprietor of the Streetsville, Ont., roller mills, has been compelled to enlarge his elevator capacity owing to increased business.

—A dispatch from Courtright, Ont., states that Philips' heading and stave mills have been burned to the ground. Loss, \$3,000; no insurance.

—The first car of new wheat was shipped from Alexander, Man., by the Ogilvie Milling Co., on Tuesday, August 21st. The grade was No. 1 hard.

—Partlo's flour and grist mill at Dorchester, Ont., was consumed by fire on the 8th inst. The loss will be heavy, and is only partially covered by insurance.

—The bonus for the erection of a flour mill at Elkhorn, Man., has been carried by a vote of the ratepayers. It is expected the mill will be erected at once.

—Mr. Wurtele's saw and grist mills at River David, near Sorel, Que., were burned recently. We learn that the work of rebuilding will be commenced at once.

—The flour milling plant of R. H. Coalfleet & Co., of Windsor, N.S., has been offered for sale by tender. The plant is for a 200 barrel mill and is almost new.

—The John Abell Machine Works, of Toronto, have recently supplied complete roller mill outfits to the Virden Milling Co., Virden, Man., and the York Milling Co., York, Ont.

—The wheat crop in the Northwest is turning out better than was expected; the average yield will be about twenty bushels to the acre. Considerable new grain has already been marketed.

—Manning's flour mill at Balmoral, Man., was destroyed by fire the early part of last month. The loss is placed at \$8,000 and the insurance \$5,000. The fire had its origin in the engine room.

—Notice has been given of the incorporation of the Pembroke Milling Co., for the purpose of operating the flour and oatmeal mills of W. B. McAllister at Pembroke, Ont. The capital stock is \$75,000.

—Bruce & Rutherford are placing additional machinery in their flour mill at Stonewall, Man. They experience a brisk demand for flour, owing to the recent destruction by fire of Manning's mill at Balmoral.

—The chattels of the estate of Geo. H. Harper & Co., of the Ashbourne Mills, Dundas, Ont., are being offered for sale by tender by the assignee, C. W. Scott, of Hamilton. The date limit is the 17th inst.

—Messrs. T. A. Crane and James Carruthers, of Montreal, and C. B. Watts and G. A. Chapman, of Toronto, have been appointed members of the western board to select grain standards. The Board is to meet in Winnipeg during the present month.

—J. C. Grant's grist mill at Windsor, Ont., has been destroyed by fire, supposed to have been caused by overheated bearings. Loss \$6,600; insurance, \$4,000.

—A. B. White has sold out his interest in the flour mill at Pilot Mound, Man., to Geo. White, and intends engaging in business with Mr. Simmonds at Forest River.

—The Forest Elevator and Milling Company's elevator at Forest, Ont., containing 6,000 bushels of wheat and 2,700 bushels of oats, was destroyed by fire on the 10th ultimo. The loss is estimated at \$6,000 and the insurance \$5,000.

—The saw and grist mill at Londesborough, Ont., recently purchased by the J. Huber Estate, was sold by public auction on the 6th inst., to R. Webb, of Auburn, for \$3,550. J. L. Eidt, who had the Londesborough mill rented for the last five years has leased a mill at Auburn for a term of years and will remove there shortly.

—The following examiners have been appointed by the Government for the grading of grain east of Port Arthur:—D. W. Matthews, Toronto, chairman; A. McFee, A. C. Thompson, R. M. Esdaile, Montreal; W. Brodie, Quebec; R. R. Morgan, Hamilton; James Carrick, J. L. Spink, H. N. Baird, Thomas Flynn, Toronto.

—The large flour mill of Tew & Marshall, at Plattsville, Ont., was destroyed by fire on the 22nd August. It was one of the finest mills in Ontario, being provided with six stones and both steam and water power. The loss on the property is estimated at \$30,000, while an insurance of only \$6,000 was carried. The fire is supposed to have originated from a defective chimney.

—The large grain elevator of the Northern Elevator Co., at Winnipeg, Man., was consumed by fire about the 15th of Aug. It contained about 40,000 bushels of grain belonging to N. Bawlf, and was the only grain elevator in Winnipeg. The loss is estimated at from fifteen to twenty thousand dollars, which is covered by insurance. It is stated a new elevator will be erected at once.

—Alexander, Kelly & Co.'s extensive flour mills at Brandon, Man., were burned on the 17th inst. The loss is estimated as follows: Warehouse, \$3,000; flour mill and machinery, \$50,000; oatmeal mill and machinery, \$10,000; elevator and machinery, \$7,000; engine and boilers, \$12,000. The town council have passed a by-law to grant the proprietors a bonus to enable them to rebuild, which will be voted on by the ratepayers on the 14th inst.

—Following the announcement of the Canadian Pacific Railway Company of a reduction in elevator rates, the Lake of the Woods and the Ogilvie Milling companies and the Northern Elevator company, who have elevators at the chief grain shipping points in Manitoba and the Territories, have declared their intention of making a reduction of half a cent per bushel in their charges for handling grain at their interior elevators from farmers' teams to ears. The present rate is two cents per bushel, including twenty days' storage; the new rate will be one cent and a half.

GOING BACK IN THE AGES.

SAYS the London, England, Millers' Gazette: A correspondent, who some years ago found himself stranded, owing to wet weather, in a Lincoln Hotel, beguiled the weary hours by reading what is called "The Lincoln Year Book," which was lent him by the landlord of the hotel, and from which book our correspondent made the following extracts and memoranda. Some of the earliest dates in this book, which is very scarce, are A. D. 45, 75 and 125, at which time Lincoln was probably on the sea coast: 272 Famine notified. 310 Famine notified, 4,000 died. 550 Wheat first grown. 739 Famine notified. 823 Famine notified. 864 Famine notified. 900 King Alfred divided England into counties. 954 Famine noted. 976 Famine noted. 1005 Famine noted. The stress of famine was so great that parents sold their children into slavery in order to obtain food. 1035 Frost on midsummer day. All the corn destroyed. 1073 A murrain among the people so great that the living could scarce bury the dead. 1130 A sheep was worth 4d. 1135 Rent first paid in money. 1172 Value of an ox 1s.; sheep 4d.; provender for 20 horses 4d.; bread for 100 men 4d. 1185 An earthquake. 1189 A Jew hunt in Lincoln. 1193 Famine and murrain among the people. 1258 A terribly wet year, and wheat rose to 20s. per quarter. 1284 Cider first brewed. 1285 Wheat 1s. 4d. per quarter. 1300 Foreign wine first brought into England. Value of a lamb 8d., and 2 pullets 2½d. 1308 Land first driven into acres. 1318 An earthquake. 1447 The king laid a tax on the city of Lincoln too heavy

to be borne of £180 per annum. This was so burdensome, the mayor and corporation set off on horseback to London to petition the king for its mitigation. 1463 Foreign wheat first brought into England. 1493 Wheat 4s. per quarter. 1521 Wheat 20s. per quarter. 1551 Wheat 8s. per quarter. 1558 Wheat 14s. per quarter. 1579 Wheat 27s. per quarter. 1614 The sea encroached 12 miles inland in Lincoln county. 1630 Plague in Lincoln. The sheriff died of it. 1667 Bishop of Lincoln fined twice for libel. 1680 First horse races in Lincoln "whereto was great resort of people." 1705 Wheat 26s. 8d. per quarter. 1722 Eleanor Elsom publicly burnt in Lincoln for the murder of her husband, being chained to a post with an iron chain and faggots and tar barrels piled around her. 1772 Intense frost. Oil froze in the public lamps. 1785 Seven men sentenced to death for murdering three turnkeys. These men were kept in a pit like a bear-pit, and when the turnkeys went into the pit to fork up the straw, they were set upon and murdered. In this year the citizens for the first time made up their minds to set a watch in the city at night. 1800 Quarter loaf 1s. 6d., wheat 100s. per quarter. 1801 A public fast because of the high price of food. 1817 First gold sovereign issued from the mint. Wheat 148s. per quarter. 1819 This year opened gloriously fine as to weather. A protracted and ruinous war, with its usual results, prostration of commerce and provisions very dear and scarce; wheat 108s.; currency depreciated; scarcity of employment and great suffering. March 25 wheat rose to 142s. per quarter; August 155s. In September a good harvest. First market day after harvest wheat fell 27s. per quarter, and next market day 31s. per quarter. Total fall in 14 days 60s. per quarter. 1824 Three prisoners escaped from the castle. One of them came back and knocked at the door craving readmission, saying he had been to see his wife and children. 1825 Inscription on an almshouse in Lincoln—"Sir W. Ellis left this for four poor widows, who shall be chaste and honest. One shall be the widow of a singing man at the cathedral, and the other three shall be the widows of freemen of this city of honest fame and good report. They shall all attend service at the cathedral and shall be able to say the Lord's Prayer and the articles of belief without a book. They shall not be brewers nor be keepers of any ale house, nor tipplers of ale or beer. They shall not beg nor harbor beggars."

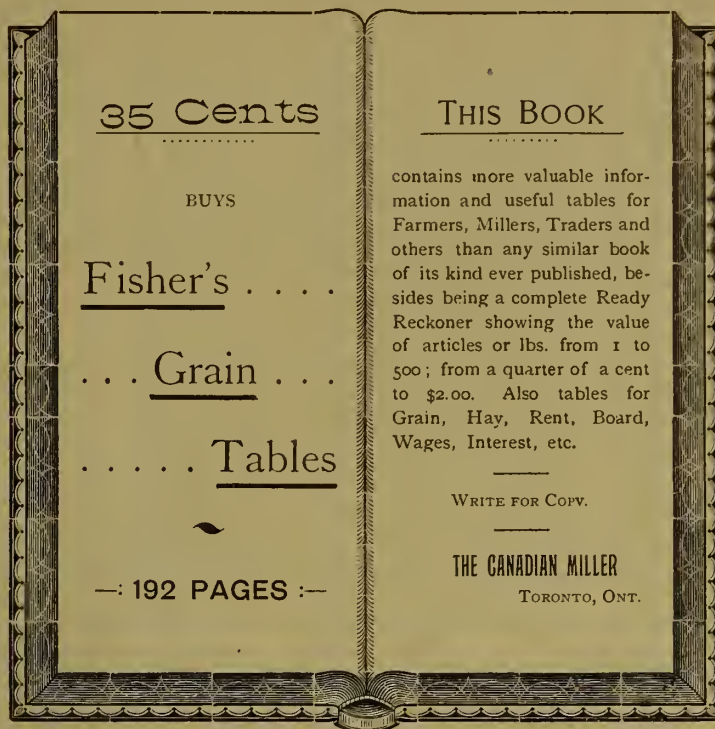
WHEAT SITUATION IN MANITOBA.

THE Winnipeg Commercial, of Sept. 3rd, says: The beginning of the movements in new wheat has stirred up more interest in the situation in Manitoba markets. At some country points deliveries of new wheat were quite heavy this week, but the most of the grain was going into store in country elevators, as the buyers were not on the market. Most of the shippers will have buyers on the market on Monday. Prices offered in Manitoba country markets to farmers range about 40 to 42c per bushel, average freight rates. The wheat now coming in is from thrashing direct from shock, for which the weather has been favorable. The sample is good. Prices were easier this week, in sympathy with lower markets elsewhere. We quote No. 1 hard at 58c. to 59c. per bushel, delivered afloat Fort William and new wheat about 57c. Stocks in shore at Fort William on August 25 were 789,761 bushels. Receipts for the week were 107,786 and shipments 248,228 bushels. A year ago stocks were 1,231,000 bushels, being a decrease of 118,889 for that week. The reduction in terminal elevator rates to ¾c per bushel for handling, (including storage for twenty days,) and ½c for 30 days subsequent storage, is a not unexpected feature of the week. In the country stacking and thrashing has made good progress, under excellent weather conditions, and the marketing shows a splendid sample of hard wheat. The western board of grain examiners meet on September the 11th in Winnipeg. As the crop is very similar in condition to last year, the work of fixing the standards for grading the crop should be comparatively easy.

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